



SOLELECTRICS;

A THEORY EXPLAINING THE
CAUSES OF

TEMPESTS, SEISMIC AND VOLCANIC
DISTURBANCES AND OTHER
NATURAL PHENOMENA.

HOW TO CALCULATE THEIR TIME AND PLACE;

ILLUSTRATED BY 150 DIAGRAMS,

BY

ALFRED J. COOPER,

NAVIGATOR,
South African War Medal.

AUTHOR OF

The Stability of Ships and Floating Bodies.

The Direction of Civilisation.

London:

PUBLISHED BY J. D. POTTER,

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1917.

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Kitchener's Death

From Admiral SIR WILLIAM JAMES

SIR,—With reference to last Sunday's review of "The Mystery of Lord Kitchener's Death," there never would have been any mystery if Lord Jellicoe's report and the daily record of the Operations Division had been published at the time.

The Hampshire was ordered to the Clyde to embark Lord Kitchener, but before the date of embarkation the Battle of Jutland was fought, and Lord Kitchener expressed a wish to visit the Grand Fleet at Scapa on his way to Russia. The Hampshire was accordingly ordered to Scapa.

Shortly before she was due to sail the minesweepers reported that, owing to bad weather, they had not been able to sweep the channel to the east of the Orkneys, so the Hampshire was given a route to the west of the Orkneys which had not hitherto been mined. The captain of the Hampshire went close in to the land to get a lee and let Kitchener have his dinner in smooth water, and she struck a mine.

The only mystery was how mines came to be laid in that spot. This was cleared up later when it was learnt that the captain of the submarine mistook Marlwick Head for Hoo, and laid his mines in the wrong position.

Admiral of the Fleet Sir Henry Oliver, who gave the Hampshire her orders, and Admiral Sir Lionel Preston, who was director of the minesweeping operations, are still alive.

W. M. James.

Churt.

See p 143

THE SUNDAY TIMES. APRIL 12. 1959

Kitchener's Death

From Admiral of the Fleet, SIR HENRY OLIVER

SIR,—May I reply to the letter from Admiral Sir William James last Sunday.

Very early in the first world war the Commander-in-Chief of the Grand Fleet, Admiral Sir John Jellicoe, had been given command of the local defence of the Orkney Islands and supplied with minesweepers and other small vessels. He also issued sailing orders to ships leaving the Orkney Islands anchorages for any purpose.

Before the Battle of Jutland, the Government arranged for Lord Kitchener to visit Russia. I arranged for him to leave the Clyde in the cruiser Hampshire with a destroyer escort as far as the Shetlands.

Then came the Battle of Jutland.

After a Cabinet meeting Lord Kitchener told me he wanted to see the Grand Fleet at Scapa Flow and I walked to the War Office with him.

I sent the Hampshire to Scapa Flow and arranged a special train to Thurso and telegraphed all

the information about Lord Kitchener's visit to Admiral Jellicoe at Scapa Flow; he then gave the Hampshire her sailing orders to go by the west side of the Orkney Islands on account of bad weather on the east side.

I hope I have made it clear that the Hampshire was not under Admiralty orders, but under the immediate orders of Admiral Sir John Jellicoe, the Commander-in-Chief, Grand Fleet.

H. F. Oliver.

London, S.W.1.

THE SUNDAY TIMES. APRIL 19. 1959

Ed Johnson

RADIO TIMES, ISSUE DATED NOVEMBER 19, 1937

Valparaiso Earthquake

MAY I correct Mr. N. Fraser (Birmingham) by saying that the man who predicted this disaster was Captain Alfred Jopling Cooper of the P.S.N.C. liner *Oriana*, who was for years a student of seismology, and who spoke of the earthquake some months before? The *Oriana* was on her maiden voyage from Liverpool to Valparaiso and back, and I was on board her in the Bay when a large number of residents were invited aboard to dinner and to view the new ship. In an after-dinner speech Captain Cooper said that in twenty-four hours a severe earthquake would take place, which information I am afraid most of us took smilingly, but he was only ten minutes out of his reckoning.—
C. Finlason, Wallasey, Cheshire.

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PREFACE

TO FIRST EDITION.

Having suffered shipwreck, occasioned by storms, three times on three consecutive voyages I naturally acquired an interest in the questions as to why storms happen on the earth, and where they come from.

Certain that every effect is the result of a particular cause, I resolved, some twenty-three years ago, to search for the causes of storms, and afterwards published various pamphlets on the subject.

On the west coast of South America I was frequently disappointed by the non-arrival of a calculated storm, until it became apparent that on these occasions an earthquake took the place of an absent storm.

This showed that under some conditions the same forces which brought about a tempest, under other conditions caused an earthquake.

And here by chance was found one reason for the placid condition of the Eastern Pacific Ocean, a fact which doubtless suggested its name to the early navigators.

The fortunate habit which earthquakes exhibit of stopping public clocks, provided me with a valuable clue as to the action of the sun during storms and other phenomena ; for that recorded time is a measure of the sun's distance when a particular influence is exerted.

My pamphlet of 1902 distinctly insisted that the sun is the first cause of these natural phenomena, and that weather is largely the result of what is termed Solectric Force, which acts on the earth in a peculiar manner when the sun and moon are in certain positions. The influence of the planets was not at that time clearly worked out.

For years I worked and studied on, searching out the truth, until at last facts fell into their places along a royal road.

That royal road I now point out to readers of this work, in firm faith that a body of expert calculators, appointed by each educated nation, will by means of it, soon be able to warn with certainty any city threatened with earthquake, or bid ships prepare for a coming tempest.

I have no apology to offer for pressing this matter boldly to the front ; but it will probably have to pass through the usual stages of criticism before coming into general use.

Critics, however, cannot ignore the fact that by means of this theory the Chilian Meteorological Office predicted the Valparaiso earthquake of 1906, and the earthquake duly came on the day stated.

The theory has advanced so far since that time, that the hour of occurrence may now be calculated as accurately as the day was then. By means of the Nautical Almanack the positions of the celestial bodies may be deduced, and experts may, by calculating dates and places of former tempests or earthquakes, according to the methods explained herein, verify the results and prove the correctness of the theory.

I believe I shall be able successfully to defend the theory against all criticism.

THE AUTHOR.

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THE AUTHOR.

SOLELECTRICS

PREFACE TO SECOND EDITION.

Many new facts and much general information have accumulated since the First Edition of this work appeared, so that it is now possible to set forth and more fully explain the solelectric theory and make it useful.

It will be seen that the subject is of great magnitude and of vast importance to mankind ; also that it is capable of providing very interesting study for future generations.

The author begs to thank the many British Consular Officers who have supplied him with data from various parts of the world, principally in regard to earthquakes. The author regrets that Universities, Meteorological offices and other learned bodies maintain a steadily obstructive attitude to this branch of research, which retards progress. This is quite in accord with the history of new ideas.

Critics are assured that the author enjoys personal abuse, as it proves that they are unable to damage the theory by argument. One class of critics however may be answered in advance, the persons " who knew all this before." Although they have well kept their secret we shall be happy to welcome them as friends now.

But loose thinkers whose thoughts never solidify into useful action, deserve no credit. The story goes that a certain man rushed into a country Inn with the news, " Boys, listen, Monsieur Bleriot, a Frenchman has flown across the Channel and landed in England."

“ Bless me,” exclaimed a podgy citizen, “ and only last year I was a thinking of doing that same myself. Some folks has luck.”

The chapter on explosions in coal mines and battleships is a recent development of the theory.

I take this opportunity of thanking Mr. H. L. Reynard, of Newark, for his encouragement and sympathy during many years of investigation necessary before writing this book.

To my fellow-Seamen I send greeting.

Knowing that I have successfully commanded ships for twenty-nine years they will feel that what is here set down may be trusted ; for the ocean is no place for fools.

The paragraph in the preface to the First Edition referring to the Valparaiso earthquake of 1906, must be read in conjunction with the full account now given in the chapter on earthquakes.

MOWBRAY,

BEACONSFIELD, BUCKS.

1917.

The Solectric System.

CHAPTER I.

The term Solectric power may be defined as the power which the sun exerts on every member of the solar system. The planet Neptune is as much under control as the planet Mercury, though Neptune is 2,794 millions of miles from the sun, and Mercury 36 millions.

Solectric power is the combined energy emanating from the sun, which when analysed or resolved into its component forces, includes light, heat, chemical action, gravity, electricity and magnetism according to circumstances and surrounding conditions.

For instance the atmosphere changes a proportion of the solectric rays into light.

Plants can capture colours from the light rays and animals turn plants into forces we call vital.

When sunbeams are passed through glass into a closed space, the heat rays are trapped, they cannot return, and thus a hot-house is made.

By means of heat we can turn water into its chemical constituents H_2O ; by the use of electricity we can turn a soft iron bar into a magnet, and by whirling coils of wire past magnets we can produce electricity.

Thus do the forces of nature appear to interlace one with another and weave themselves into other forces of quite different activities.

The first part of this work will discuss the problem of the earth's rotation on its axis, the revolution, etc., and show that they are due to solectric action.

Then will follow explanations of the causes of tempests, earthquakes, volcanic eruptions, coal mine explosions and explosions on warships.

There has been a consensus of learned opinion during the last century, which has opposed the idea that any connection exists between weather or such like phenomena, and the heavenly bodies.

The Greenwich Committee of experts who examined the weather observations taken during fifty years, and who compared the moon's phases with them, came to the conclusion that the moon exercised no influence on weather conditions.

It was as if Greenwich was supposed to be the whole surface of the world, and the moon the only factor in action, whereas there are ten solectric bodies influencing one another, not to count the asteroids, and the whole world's surface is their exercise ground.

So long as no connection could be accurately demonstrated, the attitude was scientific. And yet there are many facts which compel us to believe that the earth is a member of the solar family influencing every other member, and acted upon according to their solectric strength, by the rest of the family.

When the sun comes north and shines more directly on to the northern hemisphere, people dwelling there expect summer and fine weather; when the sun goes south, the dwellers in the southern hemisphere are equally sure of their summer.

In regard to weather that is one of the few facts upon which to safely build a theory of causes, and it is a fact which points to the sun as the most important meteorological cause.

Mankind in most countries is past the time when events are considered to be brought about by spirits good and evil. The mind of man has evolved through education, and is no longer satisfied to account for natural phenomena as being effects of such indefinite causes as spiritual agency. Science has taught us to look for the immediate cause of any effect, and that when a correct cause has been discovered, the same effect always follows that particular cause.

Meteorology, seismology, etc., are the most backward of all branches of science, because the true causes of the phenomena are unknown to those obsolete persons who darken counsel in our learned societies, and who jealously obstruct research carried on by amateurs.

The Chaldeans worshipped the sun, and built temples 4,000 years B.C. to the glory of the giver of light and heat and harvest.

The Egyptians, Chinese, Peruvians and indeed most nations in their early history combined the sun with their other religious rites. From sun worship to astrology was an easy step. Astrology, however, was the foundation of astronomy now the most accurate and one of the most useful branches of science to mankind.

Astrology busied itself over much to find out the future fortune of enquirers and became corrupt, while the good part of its work passed on to the astronomers.

In the solectric theory a new astrology arises which teaches that the sun, the moon and all the planets are continually affecting our lives and fortunes, in that they are the cause of nearly all natural phenomena, such as fine weather, storms and earthquakes.

Evidence can also be adduced to show that the heavenly bodies

may affect the mental attitude or temper of persons.

Certainly men can be killed by sunstroke or by lightning.

The theory of solectrics bases its calculations on the positions, especially the relative positions of the heavenly bodies. Astronomy supplies these positions with great accuracy, and several years in advance.

The moon is the next important element after the sun, to be considered.

Many scientists have objected to the idea that force can be exerted at a distance from the agent.

The moon is an example to the contrary, and no one questions that the moon is a principal cause of the ocean tides. The earth, the sun, moon and all the planets are in touch, attracting or repelling each other, because they are linked together by solectric power which fills the whole solar system.

This solectric force has not to travel from the sun to every member of the solar or solectric system, because the force has already arrived ; it is the varying intensity of the force acting on the solectric bodies which causes the effects about to be explained in this inquiry.

It is this force which causes a conical heap of water to rise on the ocean surface 238,000 miles away from the moon, and to follow the moon's path over the earth, as a companion to her declination.

The earth is a huge magnet and induces magnetism in the moon, also the moon is quick to receive solectric force from the earth, when the earth has become overcharged.

Sir Isaac Newton was pleased to explain the phenomena of the tides by using the word " gravitation."

Gravitation simply means weight and Sir Isaac said one weight attracted another weight in proportion to the product of their masses, and inversely proportional to the square of their distances asunder.

So accounting for the tides, Newton said that the moon being on one side of the earth attracted the water to that side and heaped up the water into a high tide. Then, explained Newton, the earth itself is more attracted to the moon than the water on the far side of the earth, consequently the water on the far side is " left behind " or heaped up on the side away from the moon, thus causing the inferior tide.

And the great reputation of Newton has compelled us to believe up to modern times that the inferior high tide on the opposite side of the earth, from the moon, is really an attraction towards the moon.

This teaching is at last becoming obsolete, for the inferior tide is actually repelled and not attracted.

The solectric theory is founded upon astronomy, and the laws of

dynamical electricity as demonstrated by the experiments carried out during modern research. Galvani and Volta were the first to investigate this branch of science.

They lived and worked about one hundred years after Newton's time, so that Sir Isaac pursued his scientific inquiries in days when nothing was known of electricity.

That is why Newton had to invent the force of gravity, and it has been a good working hypothesis though erroneous. Gravitation is not such a blessed word when we look carefully into it.

When we state that two bodies are continually attracted towards each other, if the words mean anything, we expect those bodies to approach each other; and when we are taught also that these bodies are increasingly attracted in proportion as their distance apart decreases, we are warranted in believing that the said bodies must collide.

Two such bodies under similar conditions to those mentioned, are the earth and moon, and yet neither the earth nor moon, diverges from a certain nearly rigid orbit; and there is not the least danger of them colliding—through being attracted and forced to vary their speed of revolution or their harmonious path through space. If we are to believe the attraction theory then, we must invent and predicate another force of equal power which continually repels the bodies, or keeps them apart; because they do remain apart as a fact, and have not approached each other.

To imagine this second force contrary to gravity, equal to it and acting at the same time and place, is to abolish gravity.

Gravity as an explanation of the behaviour of heavenly bodies towards each other does not apply, because it is confined to a particular planet.

We are taught that two bodies mutually attract one another; that as they approach their attraction increases in intensity on both sides.

Once the bodies have moved nearer to each other all is lost, because each one gains more power of attraction at every approach and collision must be inevitable.

Collisions do not take place, therefore, I disregard gravity as taught.

Suppose a man at the top of a building hooks his rope to a basket of bricks ready to go up, and suppose by the rules the bricks become much lighter at every foot they are raised. Moreover, the man becomes stronger as the bricks are raised. What can stop the man from lifting the load to top of house; it is merely the first foot which must be overcome.

Such laws appear absurd to me.

Besides, they do not act. Once a month the moon approaches the earth at perigee, say, 30,000 miles nearer than at apogee. A first big step has been taken, the earth and moon are fully charged with attractive power and should rush together—but they merely set to partners and continue, ignoring gravity.

The term gravity has at present too wide a signification, and it is better described as a particular attribute enabling a planet to hold together its constituent particles and thus maintain a separate existence.

The sun's solectric force endows the planet with this force of gravity, which in reality is magnetic.

Gravity acts in accordance with the law of inverse squares, which teaches that if two bodies attract each other with a certain force at a certain distance apart, they will at double the distance apart be attracted by only one-fourth of the force ; if they are removed to three times the first distance apart then the attraction will only be one-ninth of the force which influenced them before the first remove.

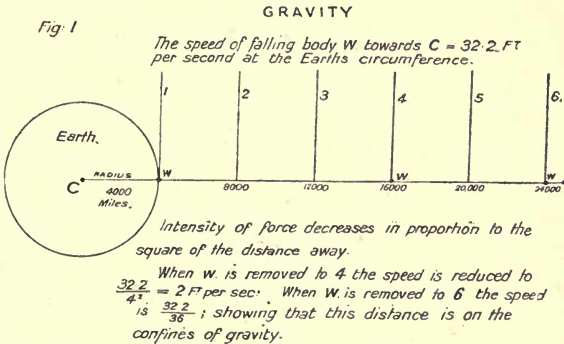


FIG. 1.

Let W be a weight subject to the earth's attraction, and to the movement of revolution. At the position W on the circumference of the earth (Fig. 1) the weight W is distant one radius, 4,000 miles from the centre C.

At this position the intensity of attraction is such that W will fall, when free to do so, towards C at the rate of 32.2 feet per second.

If W be removed a distance of 4 radii from C, the intensity of gravity will have decreased by 4 squared, that is it will only have

one-sixteenth of its former power. Dividing the former rate of fall 32.2 ft. by 16, we get 2 ft. per second as a new rate at this new position.

Removing W again to the position 6 radii away from C, we now find that gravity is almost too weak to cause any attraction, and it can be represented by the fraction $\frac{32}{6^2}$ ft. per second, that is 32 divided by 6 squared.

Gravity then may be regarded as non-existent at 25,000 miles from the earth's centre.

Solelectric force links up all the planets and derives extra potential from them, as if they formed relays to strengthen the main force.

In fact, the theory of gravitation is only a local truth and is inaccurate when applied to the solar system as a whole.

There is an attraction of matter toward the centre of each planet, but it is a magnetic attraction, and is confined to the particular planet itself.

The influences and perturbations which the members of the solar system exert upon each other depend upon a quite different natural force, called solelectric force.

We shall now endeavour to explain the general nature and action of this force in accordance with the solelectric theory.

It has been well proved that the earth is a huge magnet. The north and south poles of the earth have been visited, and at these places the dip needle is observed to set itself vertically.

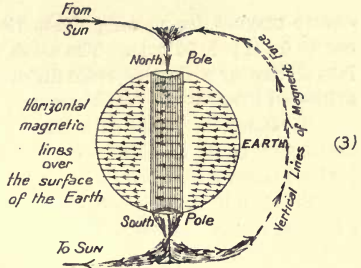
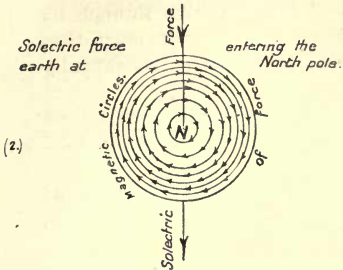
Also, a soft iron bar will acquire magnetic polarity by induction from the earth, if it is held in the magnetic meridian parallel to the dip needle.

The north pole of the earth has the same magnetic quality as the south pole of a magnet, because the so-called north pole of the earth attracts the north pole of a magnet.

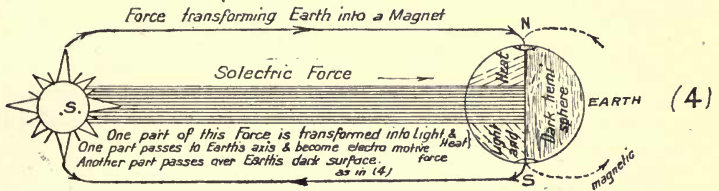
Figure (2) shows the solelectric current from the sun entering the earth at the north polar district. It shows also the direction of magnetic currents set up, as viewed by an observer facing the north pole; when the south pole is looked at, the current appears to flow in the opposite direction, left-handed. The behaviour of magnetic and electric currents when acting upon one another is now well understood, owing principally to the work of Faraday.

Also the power of magnets and their field of influence have been investigated by careful experiment. The field due to a bar magnet varies inversely as the cube of the distance from the centre of the magnet, measured out at right angles to the N. and S. axis.

It is contended here that what we term gravity is an effect of the earth's magnetism. The sun first causes the earth to become an

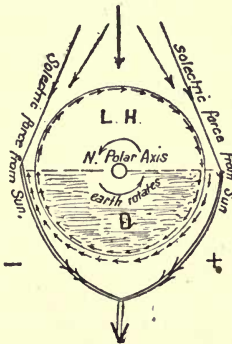


The current through the earth makes it a magnet



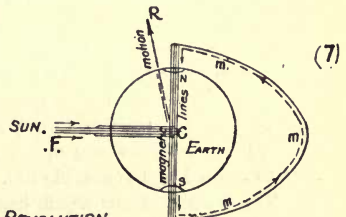
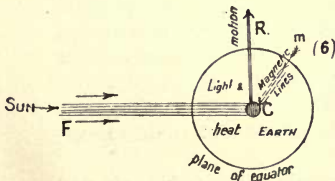
EARTH'S ROTATION

- D. Dark area where magnetic action & currents are strong
Solelectric force on the + side attracts the right quadrant, solelectric force on the left quadrant repels it; this action causes the earth, to rotate from left to right.



L.H. Area where greater part of solelectric force is transformed into light and heat, and magnetic currents are weak

Earth supposed to be viewed from N. pole to Equator.



EARTH'S REVOLUTION

FIGS. 2, 3, 4, 5, 6 & 7.

electro-magnet by passing quantities of solectric force through its centre from pole to pole. The earth then induces opposite magnetism into all matter within a certain distance, and that matter is continually attracted towards the earth's centre.

Treating the earth as a huge magnet, the influence exerted on matter 3.2 times the distance of earth's radius, will be decreased 3.2 (cubed) times ; that is 32.2 ft. per second divided by 32.7.

So that the attraction hitherto called gravitation, if considered as magnetism, disappears at about 8,800 miles from the earth's surface, in an equatorial direction.

This is much more credible than that the earth of its own force can perturb all the other planets.

We have now explained how the earth becomes a magnet, and why the earth possesses an attractive force.

Figure 3 illustrates these contentions, moreover it makes clear, in passing, that the earth's central portions are not hot, certainly not incandescent, because all traces of magnetism are lost at red heat.

Figure 4 is meant to illustrate the action of the vertical and horizontal forces which envelop the earth.

These solectric forces exist throughout the solar system ; the potential at the different planets varies, but no power is lost by the sun ; the sum total of solectric force is always the same. Whatever force issues from the sun returns again in the circuit. If the potential and therefore the solectric action is increased on any planet owing to the influential relative position of other planets at the time, the balance is soon restored.

It is while this redistribution of force is going on, that the over-charged planet, or the depleted one, suffers from earthquake and storm or other violent natural disturbance.

A study of diagrams 4 and 5 will make clear the causes of the earth's diurnal rotation. A large portion of solectric horizontal force passes into the interior of the earth as far as the central axial diameter, with a result to be explained later by diagrams 6 and 7.

Figure 5 shows the earth divided at the plane of the equator. The solectric force is streaming on to the illuminated hemisphere in Fig. 4 and on to the quadrant in Fig. 5. This force, which travels at the rate of 288,000 miles per second, is slowed down on meeting the earth's atmosphere to a speed of 186,000 miles per second, and is thereby transformed into light ; on meeting the earth's surface some of this force becomes heat or produces the elements of vitality necessary to animal and vegetable life.

The solectric force which has not passed to the earth's axis, and has not been utilised on the illuminated hemisphere, passes on, after

encircling the dark hemisphere, to other planets and returns to the sun.

But it will be noted that as the divided force passes to the right over the dark side of the earth marked D, that the currents due to earth's magnetism are flowing with the arrows, and therefore in the same direction as the main soelectric supply marked plus. The consequence is that the right side of D is attracted towards the main flow marked plus, because the two currents of electricity are flowing in the same direction. But the left side of D is repelled from the main supply passing to the left of it and marked minus because these two contiguous currents are travelling in opposite directions and therefore repel each other.

The electro-magnetic effects on the dark half of the earth's surface are much more powerful than on the light side. This is well known; but recently an interesting example has occurred which impresses it on one's memory.

The good ship "Aurora," of Sir E. Shackleton's Trans-Antarctic Expedition, was carried away by the ice and blizzard of May 19th, 1915, from her moorings in Ross Bay. She drifted about the Antarctic ocean fast in the ice. On July 22nd the ship was badly crushed by ice, and on September 5th she was dismasted.

The "Aurora" had a wireless installation with an effective radius of 200 miles, and the operator, Mr. L. A. Hooke, reports that he was able to keep in constant communication with Macquarie Island at that distance until the period arrived of perpetual daylight, when wireless signals carry only about a third of the distance which is possible in darkness.

The staff of the wireless station at Macquarie Island had however been recalled.

During June Mr. Hooke had hopes that his call for help might be heard in Australia; and during the long Antarctic winter he overhauled the apparatus and set up a quadruple aerial 80 ft. above deck. Night after night Hooke sat in his cabin straining to catch sounds which would mean that the world awaited with anxiety the story of the ship's fate.

At the end of February the ice broke and freed the ship. Not until March 25th, 1916, did Hooke succeed in obtaining definite signals from Tasmania and New Zealand, 990 miles away, nearly five times outside the normal wireless range of the "Aurora's" outfit.

I will quote a paragraph on this point from the London "Chronicle":—

"One of the greatest puzzles to wireless telegraphists is the peculiar power some signalling stations possess of occasionally trans-

mitting messages over many times the distance for which they were originally intended to operate, and it is now known that the message of March last was only made possible by a 'freak' performance on the part of the wireless equipment of the 'Aurora.' "

This matter is referred to in the last chapter, and diagrams show how solectrics can account for this.

Returning then to Figure 5 we see that the illuminated half of the earth absorbs a large part of solectric force for purposes of light, heat and the necessities of life ; while the dark half of the earth is subjected to electro-magnetic force of great intensity.

As the dark side of the earth is attracted to the right and repelled from the left the whole earth is compelled to rotate from left to right on a vertical axis.

Owing to the great speed of rotation, 1,000 miles per hour at the equator, and the mass of the earth, in other words owing to the earth's rotational momentum the time of rotation does not greatly vary. A flywheel is linked up to an engine in order to obtain harmonious, steady and even working. So with the earth, although the solectric power must vary at times by being suddenly called off in another direction by other planets, yet the earth's rotational impetus and stored force will harmonise the movement, and, by the end of a year, only slight irregularities would be discernible.

Figures 6 and 7 will clear up and explain the causes of the earth's revolution round the sun, a problem considered insoluble up to present times. As the earth's magnetism is caused by the sun's solectric force, the earth is properly described as an electro-magnet. The magnetic circuit is outlined merely at Fig. 7 letters N C S m m m, but a magnetic aura of force may be imagined as filling the space round the earth.

This is an example of a powerful electric current F C cutting strong "lines of force"—as the lines between two magnetic poles are called, and it is the principle on which all modern dynamo electric machines are constructed.

It may possibly be that the N. S. axis of the earth consists of some material similar to soft iron, in which case the magnetic power of the earth would be increased and its ability to produce electric force would also be increased. It is certain that a high potential of electricity is produced, and this potential must move and carry the charged earth along to a position of lower potential. Thus, the planet earth is urged along a mad career in space at the rate of 66,000 miles per hour.

We shall see, however, that the earth is safely held in elastic limits ; she cannot break away because motion is possible only when

energy is received from the sun. The sun's energy is transferred by horizontal radii sketched in Figs. 6 and 7.

These radii are most effective when cutting the magnetic core of the earth at right angles; consequently any deviation from a circular orbit would bring the sun's horizontal force to meet the vertical lines N. S. at some angle, and there would be a diminution of electric-potential at the earth.

This would tend to diminish orbital speed, but the earth's momentum would rectify this.

The illuminated half of the earth rotates in a backward direction and contrary to the direction of the earth's motion in orbit, Figure 8 or Plate I.

This is a uniform drag on the inner or sunny half of the world and it causes the earth to turn continually inwards and pursue a nearly circular course. The moon modifies the earth's orbit, but we shall have dipped sufficiently into astronomy for the present after setting at rest the problems which have reference to the soelectric theory, without discussing this complication.

We have seen that the major part of the horizontal electro magnetic energy of the earth is applied at the outside or dark hemisphere, and causes rotation; this action counterbalances and adjusts any tendency of the earth to unduly approach the sun.

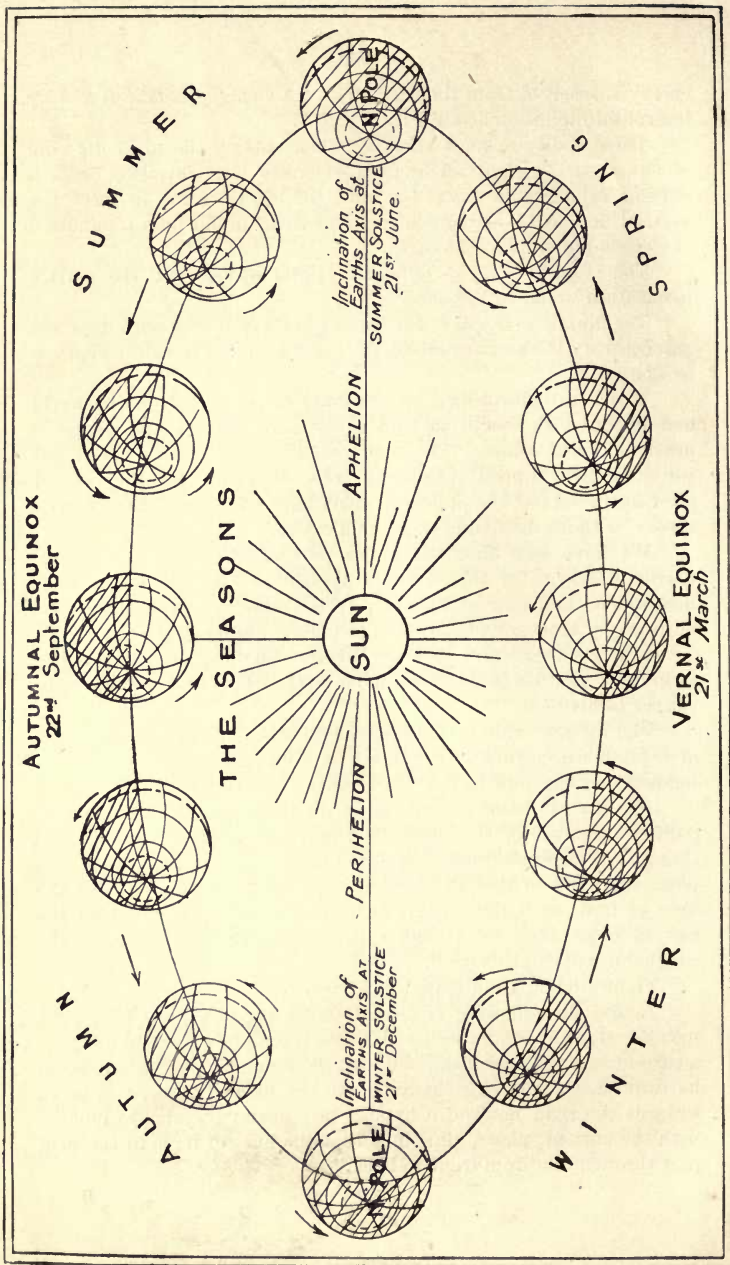
It is necessary now to know whether the charged earth if free to move in an orbit (as it is) will move to the left of an observer at the sun, or to his right.

The dynamo rule used by engineers when tracing the direction of a produced current or conductor of a current free to move, is as follows, quoting from Kapps "Electricity" p. 170 (1912).

Use the left hand for indicating the three quantities concerned, namely direction of the magnetic force, current and motion. Set thumb, forefinger and middle finger at right angles to each other, and place the hand so that the forefinger points in the direction of the lines of force, and the central finger in the direction in which the current flows, then the thumb will indicate in which direction the conductor will displace itself.

Figures 6 and 7 illustrate this.

Again, the following is from Ganot's Physics, page 935. "A movable straight conductor (in this case the radius of earth) carrying a current in a magnetic field, and capable of moving at right angles to its own length, and at right angles to the lines of force, will move towards the right hand of a hypothetical swimmer, who, swimming with the current, places himself so that the lines of force in the field pass through him from front to back."



It is evident from these rules that the earth subject to all these forces must obey and rush off in the resultant direction indicated.

Thus we find the revolution of the earth in its orbit to be, both as regards speed and direction, consonant with the principles of electro magnetism—which is itself due in the first instance and primarily to the sun's soelectric force.

There is another problem which may be cleared up at this juncture

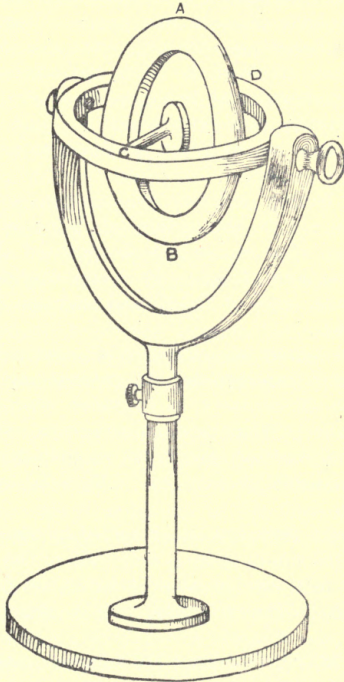


FIG. 9.

that is, why does the earth's axis so uniformly point in the same direction, which is just a little from the north star?

It is true that owing to the solar family perturbations, "the earth performs none of its motions with rigorous precision" says Dr. H. R. Mill in "Chamber's Encyclopædia."

It is fairly accurate to say, however, neglecting astronomical refinements, that the ends of the earth's axis are steadily directed to

north and south points of the heavens during the whole orbital journey of 580 millions of miles.

This is made possible and is caused by an extraordinary natural law, which confers on any material body that rotates on its axis faster than a certain critical speed, the property of maintaining that axis always directed to the same point in space.

Fig. 9 is a sketch of a gyroscope, and A.B. is a wheel having a heavy rim, and is so suspended on 3 axes, mutually at right angles, that rotation can take place in any plane. When the wheel A.B. rotates several thousand times per minute the axis C.D. will maintain its direction in space, although the whole instrument be moved about.

The earth is endowed with this gyroscopic attribute owing to its great speed of rotation already referred to; and thus the earth's axis, having once been set, maintains its direction north and south in space; see figure 9, or plate I.

The phrase "having once been set" suggests the question "Can any reason be assigned for the earth's axis being set in the direction in which it is set; what causes this obliquity of the ecliptic? In the writer's opinion none of the forces so far considered are able to constitute this stable angle of $23^{\circ} 27'$ and maintain it through all the year and every year.

We therefore search for another force, and only the admirable work of astronomers can help us. In "Astronomy," by Arthur R. Hinks, Cambridge Observatory, it is stated when speaking of the sun's motion in space, "There is a general consensus of result that the motion of the sun is directed toward the constellation Lyra, or at any rate toward that region of the sky." Vega (a Lyrae) is in about 39° N. declination.

Mr. Hinks (page 169) says, as a result of spectroscopic work, that "the velocity of the sun in space is four radii of the earth's orbit per year, and at this rate the sun would take 70,000 years to reach his nearest neighbour." The neighbour might prefer an even more leisurely call.

Four times 93,000,000 miles = 372 millions; such is the distance through space which the sun travels every year towards Lyra, accompanied by all the planets.

Here we have a cosmic force capable of anything. It is a force beyond our comprehension, yet it may well be that anywhere near the orbit of the earth this sovereign of all forces flows magnificently past the plane of the ecliptic at an angle of $23^{\circ} 27'$, and the axis of our earth points the direction of that flow.

We have now, from a solecistic point of view suggested the causes which are responsible for—

- (1) The earth's magnetism.
- (2) Which end of earth's axis is north, and which is south.
- (3) The earth's diurnal rotation.
- (4) The light and heat area.
- (5) The earth's revolution round the sun.
- (6) The obliquity of the ecliptic.

One other question may be asked—Can solectrics (or electro magnetism which is part of it) throw any light on tide causation ?

Sir George Airy considered Newton's explanation "a miserable theory" and so does the writer. Airy was a first class mathematician, and the writer is not.

Lord Kelvin, Sir George Darwin and other scientific headlights bolstered up the dynamic theory of the tides, and it is not exaggeration to say, that they forced the belief in this sorry theory for years. Then came Canon Moxly ("The Tides" simply explained), who slew the theory and jumped upon it. With a wealth of expression the Canon cast contempt both on the pedantic dynamical theory and its main supporters. For those supporters had been rude to the Reverend Moxly, as persons in authority often are to unofficial civilians daring to engage in research.

"The Tides Simply Explained" is a gem of scientific controversy and Canon Moxly showed himself second to none in mathematical criticism.

He even showed how Airy misinterpreted the formulæ in regard to tide expression.

Canon Moxly sent me a kind letter after reviewing his book, though I took exception to his explanation of the inferior tide (the tide on the side of the earth remote from the moon) as being the result of "another force equivalent to the force of attraction, but acting in an exactly opposite direction, which keeps the earth and moon asunder."

Two equal forces acting in opposite directions at the same time and place can but destroy each other. The problem of tide causation is difficult and complex if worked on a wrong theory, and it has proved the wreck of many a scientific reputation.

Only the solectric theory is capable of dealing with it in a satisfactory manner.

There are so many other physical problems, however, of equal importance to be dealt with, and which have not before been attacked, that I find there is not space to deal fully with tides in this volume.

After studying this work and noting the many various phenomena which have been amicably settled, the reader will perceive that the tide question is not insoluble, and that it will be amenable to solectric treatment.

Solectrics.

CHAPTER II.

The solelectric theory teaches that the whole solar system is an expression of solelectric force ; the sun and planets are held together by this one great force, and their mutual influences and activities are the effect of its action upon them under changing conditions.

Nature varies and places limits on her own laws, and when driven to a corner, as it were, changes the substance itself and makes the new substance subservient to quite different laws.

For instance, water boils at 100° centigrade, but when it is subjected to a temperature of $1,200^{\circ}$ centigrade the water begins to change and become something else—in fact, the water breaks up into its constituent gases.

Nature is intoxicated with the power of her own variety and prides herself on the silent automatic working of the solar system—to mention this system only.

Numberless great laws have been ordained, and many lesser laws to correct errors in the automatic working.

Heat expands the majority of substances and cold contracts them, but if cold contracted water when it changes into ice, the ice would sink and block many rivers and seas.

So it is ordained that water at a temperature of 0° centigrade expands, becomes solid and floats.

Solectrics will bring to view another set of laws, unsuspected hitherto, and yet they are principal laws and derived from the Cosmic statutes.

Science searches by observation and experiment into knowledge of these laws principally with the object of benefitting mankind.

Light travels in straight lines from the sun but on meeting a solid it is reflected, and the angle of reflection is equal to the angle of incidence.

When light passes from one medium to another it is not reflected, but refracted, bent over in different degrees according to the peculiarity of the medium.

If a ray of light falls on a surface of water so that its angle with the perpendicular is $52^{\circ} 45'$, the ray becomes polarised ; the polarising angle for quartz is $57^{\circ} 32'$.

Sound travels about 1,100 feet per second through air and 4,700

feet per second through water, but refuses to travel at all in a vacuum.

So that however surprising Nature's ways and manners may be, they are usually effective and economical, and in studying a new subject we are prepared to accept strange facts.

Electro-magnetism is not a backward branch of science, and the behaviour of electricity and magnetism under numerous diverse conditions has been beautifully worked out by many excellent experimentalists.

In the former chapter we thoroughly discussed the action of the sun on this earth, but the soelectric power passes on to the other members of the solar family. It is more correct to say that the sun's power has not only reached the confines of the solar system, but for untold centuries has pervaded every particle of matter in it and dominated the distances by filling the spaces with electric energy.

So that the soelectric force has not to pass from the sun to Neptune for example, because it is already there, causing Neptune to rotate, and to revolve in an orbit.

But if Neptune should come into line with another planet and the sun, for instance Venus, Neptune will experience at about the time of Venus' transit an increased soelectric potential.

Neptune will be perturbed, increasing its rate of rotation and its speed of revolution as Venus nears conjunction, and probably decreasing those velocities after Venus has passed the transit across the sun, as seen from Neptune.

The scientific belief that planetary revolutions and perturbations are all due to mutual attractions has landed astronomers in dire dilemma.

Attraction of one body for another never reaches 2,794 millions of miles—Neptune's distance.

The mass of the earth is 81.5 times greater than that of the moon, yet the earth is unable to pull the moon out of its orbit and tack it on to the south pole for example ; it would be a small matter similar to 40 lbs. being absorbed by a ton weight.

Astronomers set some " hard sums " for themselves, for instance, " What will be the motions of three bodies under the influence of their mutual attractions ; moreover what effect will a greater number have on the combined movements of all ? "

The " problem of three bodies " is insoluble by any processes yet invented, declares a modern and eminent astronomer, speaking of the sun, earth and moon and their mutual attractions. Such problems the writer declares are not necessary because the foundation of the planetary motions is not attraction. Every heavenly body, so

it is said, attracts every other heavenly body with great power through millions of miles, yet they all continue rushing around in their same orbits for millions of years. It is a marvellously absurd idea.

This solectric theory maintains that the sun is in electric circuit with every planet in the solar system, and each of these planets can, within limits, increase the potential of the solar current, or store it for a time.

Solelectric currents are continually passing into and around the planetary bodies with very various effects, in fact causing all those effects which we class as natural phenomena.

Such results of solectric energy as storms and other displays of natural forces are due to the influence of solectric bodies when situated at certain exact distances from one another.

The word "distances" is not used in its astronomical sense, as a measure in space—distance and direction must be transposed on to the earth's surface, so that they may become of practical use in calculation of positions and time.

In order to do this the actual position of a heavenly body is first worked out by finding its exact hour angle and declination at a certain stated time.

From this deduced position a vertical line from the body is dropped to the earth's centre.

The place where this imaginary line strikes the earth's surface is taken as the position of the solectric body acting on the earth, and a centre to measure from.

And now appears another of Nature's extraordinary laws, so illustrative of her love for variety and ability in design.

The influence exerted by this solectric agent is not apparent or conspicuous at the position of incidence so far as the phenomena under discussion are concerned.

But on a circular belt having a radius of $57^{\circ} 30'$ from the point of incidence on the earth's surface is a peculiar power, an increase of potential, a condition of sensitive solectric activity; and this ring of power seems to be identical with negative electric force.

There is a second circular belt having a circumference described over the earth's surface with a radius of 88° from the same point of incidence. On this belt also a peculiar power of extra-potential resides, similar to the other belt, but in quality and properties probably identical with positive electric force.

In practice these measurements may be taken from a mercator chart, using the degrees of longitude, which are equal.

After 60° of latitude the belts of influence are somewhat inaccurate. In compensation for this, however, is the fact that the belts

in their circle of greatest intensity are about 3° wide and shading off.

Also, I find that soelectric force acting along a meridian has a greater range than when acting on a parallel in east and west directions.

On this point it occurred to me to inquire from Mr. Marconi his experience in regard to the despatch of wireless messages in a north and south direction, as compared with the power requisite to despatch them in an east or westerly direction.

Mr. Marconi very kindly replied as follows :—

WATERGATE HOUSE,
YORK BUILDINGS, ADELPHI,
LONDON, W.C.

ALFRED J. COOPER,
"Glendovere,"

29th June, 1910.

Totland Bay, Isle of Wight.

DEAR SIR,

I beg to acknowledge receipt of your letter of the 25th inst., and to inform you in reply that it has recently been ascertained for certain that signals transmitted from east to west, or *vice versa*, require a greater amount of energy than those transmitted over a similar distance in a more or less south-northerly or north-southerly direction.

Yours faithfully,

(Signed) G. MARCONI.

Astronomers have noted certain perturbations of the planets in their orbits, and have ascribed this effect to attraction of one planet by another.

What has really happened is that a planet has got into a position which interferes with the supply of soelectric energy by either increasing or decreasing it.

Not only does each member of the solar system influence its neighbour in regard to the path of its orbit, but as all are in firm soelectric connection with the sun and one another, there is a continual adjustment of soelectric force being carried on. When two planets pass each other on the same soelectric vertical plane, or the same soelectric horizontal plane, it would appear that an intensified flow of soelectric force takes place. This force is either at once passed on through the shortest paths of conduction if a planet is met with which is on the same soelectric meridian, or the increased potential is stored up until other planets pass at certain definite angles to the other. In such cases there occurs a discharge of soelectric force and a rebalancing of potential, so that soon a more equalised distribution of soelectric energy once more reigns. When these redistributions take place, every planet is affected, or violently disturbed, according to the

number of planets which are acting at the particular time.

So far as disturbances on or of the earth are concerned, the sun or the moon takes a leading part ; in severe disturbances both together are acting, with one or more planets.

When a planet becomes surcharged with solectric energy its first function is to dissipate it to other planets and get it returned to the sun. To carry out this important process the planets must be at the moment in certain definite relative positions in regard to each other. Certain definite laws hold good during the complicated interaction of the solectric bodies. Solecetric bodies have an intensified action when they are $57\frac{1}{2}^{\circ}$ distant and 88° distant from one another, and the influence of a solectric body on the earth is conveniently marked off by measuring a radius of $57\frac{1}{2}^{\circ}$ or 88° from a point on the earth's surface vertically under the body as already described.

These arcs or curves are passing over the earth's surface continually owing to the diurnal rotation of the earth ; but they are of no effect unless they intersect, and then only at the positions in the vicinity of the intersections.

A single planet and the sun strongly affect the earth at the intersection, and a single planet and the moon also have that power, but the severity and extent of any disturbance depend upon the number of planets acting on one area.

The quantities $57^{\circ} 30'$ and 88° measured on the earth's surface are arcs of these angles measured at the earth's centre.

The angle $57\frac{1}{2}^{\circ}$ was discovered by the writer after long experience from actual observation, and the same remark applies to 88° .

There was no theory to prove when these angles were found to be effective ; no fascinating quest of X and Y ; no pretty tricks with ever-changing formulæ, nothing until all the possible errors had been made and rejected then truth was seen, where she has always been, well hidden.

Curiously, this first angle of $57^{\circ} 30'$ is very near the radian angle of mathematicians $57^{\circ} 18'$, when the arc equals radius of a circle ; and 88° is near to being a right angle.

Consequently it is possible that after the solectric force enters the earth at the incident point and arrives at the centre it is there reflected and decomposed into its two constituent qualities, positive and negative electricities.

As they undergo reflection at different angles the positive force emerges at an angle of 88° from the incident rays, and the negative force emerges at an angle of $57\frac{1}{2}^{\circ}$. The breadth of belt on the circle of emergence may be assumed as about 3° for sun or moon and 2° for a planet.

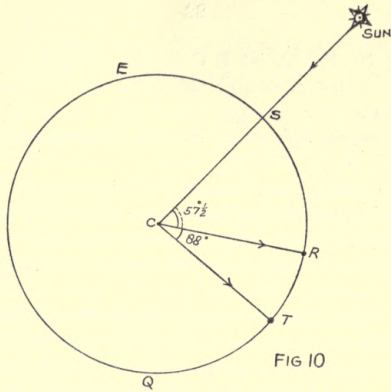
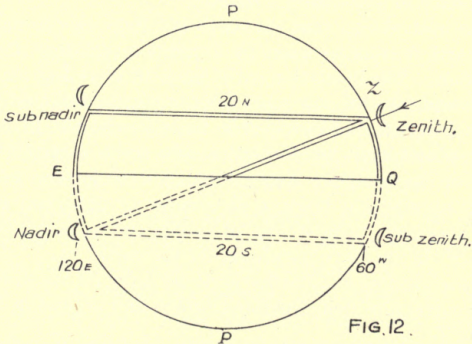
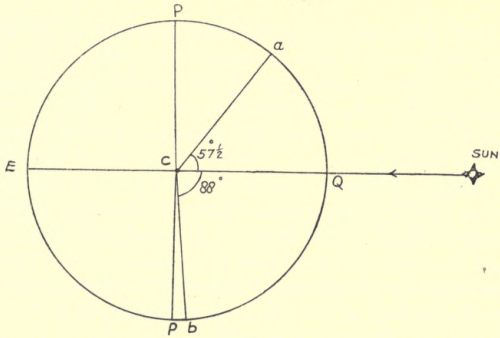


FIG II



Double lines = denote positive force.
Dotted lines = denote negative force.

In Figures 10, 11, 12, let E Q be the equator and C the centre of the earth. S is the sun or a planet, from which a supply of soelectric force arrives at C.

In this region the force is divided by reflection and passed to the surface R T.

It has been found from hundreds of observations that the earth is a charged conductor of soelectric force and instantly responds to any access of potential. There are four positions on the earth from which circles or arcs of influence may be drawn with the radii above-mentioned.

The point of incidence, vertically under the soelectric body, is the Zenith point ; the point diametrically opposite is the Nadir.

The Zenith point has a secondary point on the same meridian ; but on the opposite latitude across the equator this is the sub-Zenith point.

The Nadir point also has a secondary point on its meridian, and on the opposite latitude this is the sub-Nadir point.

When the electric current passes the equator it changes its sign from positive to negative, and *vice versa*.

Figure 12 shows moon's rays falling on the earth at Z and passing on to Nad, the Nadir position. If the force is of red or positive quality it will be changed to negative at Nad. The position sub-Nad is the sub-Nadir on the same meridian as Nad, and the same distance from the equator on the other side of it. S Z, sub-Zenith, is due south of Zenith, and the same distance from the equator as Z. These points are centres of circles of influence. The radii of these circles (or arcs) are always either $57\frac{1}{2}^{\circ}$ or 88° , and are conveniently taken from the longitude scale of a Mercator's chart.

It has been shown that the earth is a huge electro-magnet afloat in space, and it is acted upon by currents circulating around it and its insulation. The insulation is the most effective known, the atmosphere. During storms and other natural phenomena this atmospheric insulation is penetrated by soelectric force (see Figure 13).

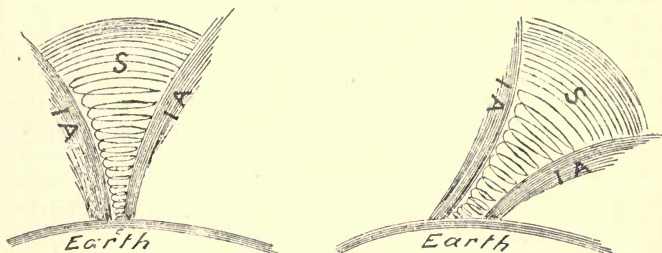
This atmosphere or insulation has very complex attributes. Apart from containing a mixture of gases necessary to the life of plant and animal and being a distributor of light and heat, it is a soelectric necessity. One result of having no atmosphere would be stoppage of the rotatory movement of the earth.

The atmosphere enables the earth to carry all the diverse electro-magnetic currents which circulate through and around it, as described in Chapter I.

These currents being insulated preserve their individual attributes, and are attached to and form part of the planet. Conse

quently, when the main supply current acts on them, the result is rotation of the earth already described.

When two planets during their incessant and varied movements in their orbits pass each other in line with the sun, there is a sudden increase of solelectric power in each. It is as if an ordinary electric current arrived at a receiver station and was passed through a relay to intensify it, in the familiar manner of telegraphy. The solelectric forces, one may repeat, have not to travel on every occasion through space, from sun to planet, or from planet to planet, because they are already there all the time ; it is merely the difference of pressure, so to speak, which is felt along the line of solelectric force.



S.—Solelectric power forcing a passage through the 1 A insulating atmosphere.

FIG 13.

It may be objected that we are filling up the solar system with a new element, a new hypothesis. For generations science has had to make use of the hypothesis of an all-pervading ether in order to make the properties of light understandable as a wave theory.

But ether cannot account for rotation, nor for the earth's inclination to the ecliptic, nor the tides, nor the electrical display during storms and earthquakes. The hypothesis of solelectric energy can account for all these phenomena, and ether does not seem necessary ; whereas light, heat, etc., are component parts of the solelectric force. If solelectric energy is allowed to take the place of ether, matters scientific will be simplified thereby. The law of inverse

squares shows how nearly related the forces of gravity, electricity, magnetism, heat, etc., are to each other, and seem to declare that they are one force, expressions of the sovereign power when in contact with various conditions. For example :—

1. The attraction of gravity between two bodies is directly proportional to the product of their masses and is inversely proportional to the square of their distances asunder.

2. The intensity of heat is inversely as the square of the distance separating the source and object.

3. Coulomb discovered that magnetic attractions and repulsions are inversely as the square of the distances.

4. The repulsions or attractions between two electrified bodies are in the inverse ratio of the squares of their distance.

The exact times of the moon attaining its extreme declination north or south will be frequently referred to, and it is remarkable that the area then mapped out by a curve of moon's influence is the area destined to be affected by coming combinations. See plate illustrating moon's path, page 36.

When at its extreme declination the time occupied by the moon in moving 1" (second) on each side of the extreme range is noted and used as a basis of calculation. This time is very variable, twenty minutes being common, and an hour not unusual. The longer the moon hangs and lingers at its extreme range north or south, the greater the area which seems to become prepared for future and sometimes almost immediate disturbance.

The sun also acts at this time of moon's extreme declination, and if a planet should be in company a disturbance is in preparation.

Another soelectric event is the moon's crossing of the equator. Obviously this does not take place in a moment, and the time occupied in passing from 2' on one side of the equator to 2' on the other side is sufficient to allow.

This usually gives twenty minutes for the movement on each side, but this amount of margin is seldom necessary in calculation.

The moon probably has no atmosphere and is therefore not insulated.

On this account the moon is of great utility to the earth as a storehouse or reservoir of soelectric energy. If the earth should be suddenly subjected to a great rise of potential—become surcharged from the sun or other bodies—the moon is ready to receive the overplus at once and relieve the tension.

If the earth is drawn upon too largely, say for positive force, the moon can assist in the supply.

But the moon must be within the range of $57\frac{1}{2}^{\circ}$ or 88° from the

spot requiring assistance, or from a planet within range of that spot, and the moon, owing to her rapid change of right ascension, some 13° a day, is seldom many days before arriving at a position favourable for drawing off from the earth the surplus forces and restoring equilibrium.

Briefly the soelectric theory teaches that the earth at intervals becomes surcharged with soelectric energy, both directly from the sun and indirectly through planets and moon, and this soelectric energy is returned to the sun according to circumstances.

If the accumulated energy is spread over a large area, say of flat country, or of sea, a storm occurs ; if the energy has been gathering for ten or twelve days and is concentrated near a mountainous district, an earthquake takes place ; if the earth has become surcharged for a month or more, volcanic eruptions follow.

The sun and moon may act together, or the sun, moon and one or more planets may act together, and at both angular distances mentioned, or a combination of planets may take effect.

A sudden escape of pent-up forces is only possible near districts in which there are mountainous peaks. These peaks being thrust far through the insulating atmosphere, constitute excellent soelectric conductors.

When it is desired to facilitate the outflow of electricity during electric experiments in the lecture room, resort is had to the action of points. The peaks, and points, and sharp mountain ridges facilitate the sudden dissipation of huge accumulations of soelectric force in nature. The surface of the earth, however, at such places is violently lifted during the discharge of these forces, and earthquakes result. But this sudden escape can only take place when there are soelectric bodies so situated in regard to the place and to themselves as to be in a soelectric closed circuit, formed by their relative distances of $57\frac{1}{2}^{\circ}$ and 88° , at a given moment.

In this event the moon is nearly always one member of the detonating combination, and through it the forces rush back to the sun.

On those occasions when the sun and moon are on the same declinations north or south, their 88° arcs may intersect over the same area as their 57° arcs do ; one set being measured from say south of the equator, and the other from north of it. In such case a storm is certain to develop, and become severe if any planets are assisting, over the area stated.

It frequently occurs that the sun and a few planets are in such a position relatively to one another that a strong soelectric combination results over a position, call it A on the earth

At the same time the moon has got into combination soelectrically with other planets over position B.

Now B may be distant from A, but the combinations are too powerful to be delayed, consequently there is a violent transit of the forces at A towards B along the surface of the earth.

This plays havoc with the insulation (the atmosphere) during its passage, and this phenomenon is known to us as a hurricane or blizzard and such like displays of force.

Had the forces at A nearly converged at B in hilly country, an earthquake would have happened to mark the circumstance.

In regard to the manner in which a soelectric charge may force its way through the atmospheric insulation in places destitute of high lands, it is to be remembered that the atmosphere is made up of four parts of nitrogen to one of oxygen.

Oxygen is magnetic, and a good conductor. During, say, a cyclone there is always an area of very low barometer, as if the air had been violently pressed aside by the passage of a column of force, ascending or descending.

It may be that the action of soelectric bodies at certain angles on the atmosphere is to displace the nitrogen and attract the 20 per cent. of oxygen, and thus by means of the conductivity of oxygen, and that of rain water, access may be had to the earth's surfaces.

The total energy emanating from the sun consists roughly of three divisions. There are the ultra-violet rays, about one-tenth of the total intensity; there are the visible rays which constitute about two-tenths, and there are the infra-red invisible rays, which form about seven-tenths of the total energy.

From what has been contended here it will be realised that the invisible soelectric rays have to bring about the rotation of the earth, and its other movements, and that they are also the chief cause of surface disturbances, earthquakes and volcanic effects.

The full theory of soelectricities having now been expounded, as clearly as the present state of knowledge will allow, examples are furnished to illustrate the details and serve as proof of the statements advanced.

As the above laws have been at work through prehistoric times, 100 years ago and yesterday, and as every year is full of examples, they will be given in any order. Those cited are examples which have been calculated because the details are known to the writer.

The symbols used in this work are, for the Sun ☉, Moon ☾, Mercury ☿, Venus ♀, Mars ♂, Jupiter ♃, Saturn ♄, Uranus ♅ or ♁, Neptune ♆.

CHAPTER III.

Among the curiosities of natural phenomena are waterspouts.

Learned bodies are somewhat chary about explaining these. Water in the form of spirally rotating pillars, joins the ocean with the clouds above. These pillars, huge as a liner's funnel in diameter rush angrily over the sea surface and threaten to engulf any ship they encounter.

It is the fashion in scientific books to depreciate waterspouts; they are spoken of as whirlwinds "carrying spray upwards" or that they are "formed of condensed vapour"; spray and vapour are harmless, so the waterspout being hard to account for is shelved as unworthy of more discussion.

Once you have been shipmates with a waterspout you ever after respect his grandeur, his mystery, and his power for mischief if he so wills.

To see four or five spouts in a group whirling and hissing, dark columns towering to the clouds, the agitated sea, with occasional lightning flashes, the very dome of the heavens black with menace, all this warns the seaman of danger, in spite of school books.

The moon is blamed for raising the tide wave on the earth—a matter of two or three feet on a wide ocean—and the question as to how she does it causes professors to be cross with each other.

The waterspout will mount up several hundreds of feet and consist of hundreds of tons of water.

To say that these are caused by "ascending hot currents of air and descending cold ones" or that they are "due to the contact of two winds blowing in the upper regions of the atmosphere" carries no conviction to any one who has observed their character and conduct.

At Bahia on a calm day I once saw a waterspout enter the bay, and happily, steer to the opposite low shore.

Arrived there its progress over the land could be noted by whirling trees with roots in the air and a general confusion rotating towards the sky.

Waterspouts are not conveniently investigated, but by analogy, and solectrics, some light may be cast on their probable cause and their uses.

Whirlwinds on land are nearly related to waterspouts and according to the solectric theory result from the same causes.

The desert simoon is a hot suffocating wind of cyclonic nature; the central calm is surrounded by violent eddies of intensely heated air. "Its presence is heralded by whirling currents of air and indicated by the purple colour of the atmosphere. It often carries

with it huge rotating columns of sand ; it is highly deleterious to man and animals, causing the sensation of suffocation, together with great pain in the limbs."

The passage upwards from the earth of large quantities of negative soelectric force accounts for the heat evolved, and the rotating currents outside the central core.

We shall see that positive electric currents strike downwards and produce great cold at the point of incidence.

Waterspouts are caused by the earth at some particular area of the ocean becoming overcharged with negative force. This pressure is relieved by the passage of the overcharge to the sun and a planet, or to two planets when these bodies arrive at positions $57\frac{1}{2}^{\circ}$ from the overcharged area.

To do this without the assistance of mountain peaks and to enable a large current with perhaps a low potential to penetrate the insulation of the atmosphere, an intervening conductor must be established between the sea and the higher regions of the air where positive force awaits the negative ; and the soelectric forces now no longer at rest eventually flow to the sun.

For the sun resembles an enormous electro magnetic battery, at which on the return (as it were) of the soelectric forces from the circuit of the solar system, they are automatically commutated, and again become soelectric power. Nothing has been lost although the forces have changed their nature many times.

The conductor which is necessary as a means for bridging the atmosphere above the ocean is a waterspout.

The two relieving planets say, have thrown their intersecting arcs over the affected area. Heavy clouds of water form overhead charged with positive force ; a hollow conical shaped tube first develops and hangs downward increasing its length and swaying about in its endeavour to join up with the negative force. Out from a great turmoil of water a cone emerges from the sea, and presently a junction is formed and a huge rotating column of water enables the stored soelectric force to pass away freely above the clouds.

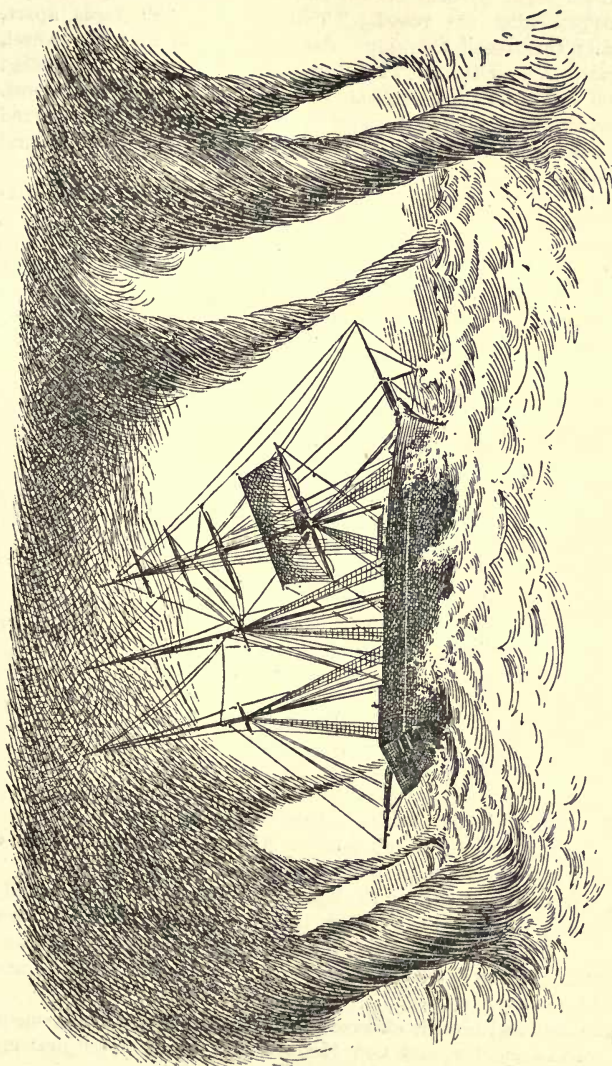
Probably there is an exchange of forces the positive from aloft flowing down inside the spout by a core of conducting oxygen, and the negative flowing upwards by the surface of the spout.

Perhaps three fourths of the length of the waterspout is of fresh cloud water rotating round its core of electricity.

A few examples will be helpful :

On May 17th, 1896, the barkentine " Edith Sheraton," bound from Macoras, San Domingo, with sugar, was about 20 miles off Cape Hatteras.

THE EDITH SHERATON DODGING WATER-SPOUTS.



The barkentine Edith Sheraton, from San Domingo, had a very narrow escape from destruction from water-spouts off Cape Hatteras May 17, besides encountering squalls and gales.

New York Herald.

About eight o'clock, in the morning, eight waterspouts were seen approaching the vessel. "Two of them 200 yards apart, especially threatened the ship. Captain Mitchell took the wheel, and watched his chance. The hissing of the spouts was deafening. Mitchell luffed for the smallest, and kept away for the biggest. The former hissed only 20 ft. away from the bowsprit, and it careered like a balloon over the vessel, the spars almost pricking the natural waterbag.

"The latter was 40 ft. wide at the stem, and this immense waterspout passed within 100 yards of port quarter.

"There was a good fresh breeze, and no wash from the spouts, and they all burst to leeward. At 9 a.m. the sun was shining, and all sails were set."

We may take the time as 8 hours 20 minutes a.m. at place, and as Cape Hatteras is in 75° W. the Greenwich time of occurrence is five hours later, say 1 hour 20 minutes p.m.

— WATERSPOUTS. —

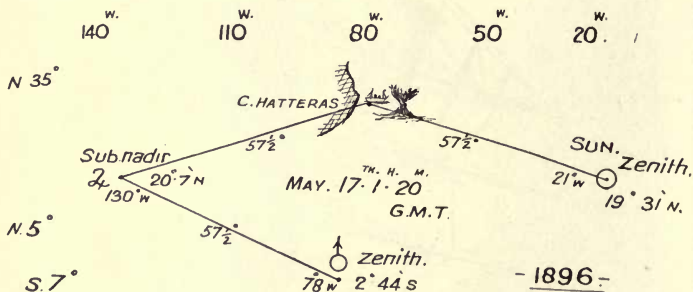


FIG. 14.

Position of solelectric bodies at time of occurrence.

On April 28th, 1896, ship being in 26° S. and 46° W. I noticed a large waterspout to leeward and steered down to examine it.

The terrible turmoil and the huge dark tower of water, powerfully threatening, was enough, however, to inspire caution; so when my friend the Doctor remarked that his fees were extra for any fool who went "monkeying" with a waterspout, I saw the allusion, and steered for safety.

The area had become charged four days previously by the moon when on the equator, and now Mercury and Uranus were drawing off the surcharge.

1896
 April 28th 1^h 34^m.
 Green-mean-time

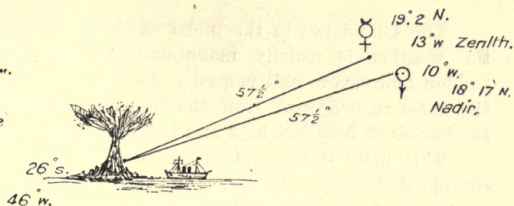


FIG 15.

On April 24th at 6.10 the moon was passing over the equator in 130° W. (Nadir)—at that time the moon was 88° from above position, 26° S., preparing it.

Again, in the year 1900, November 30th, about 1 p.m., G.M.T., the moon was passing the equator and 95° W. Nadir, and an arc of 88° fell over Bahia in Brazil.

This prepared or surcharged the district.

On the morning of December 2nd a large waterspout visited the bay and paraded the harbour, causing much anxiety to the vessels anchored about. It then proceeded peacefully to sea again.

The immediate causes were as given below :—

1900

Position of Solectric bodies
 December 2nd. 8.42 local time.A.M.
 1st. 23-18^m Green-mean-time.

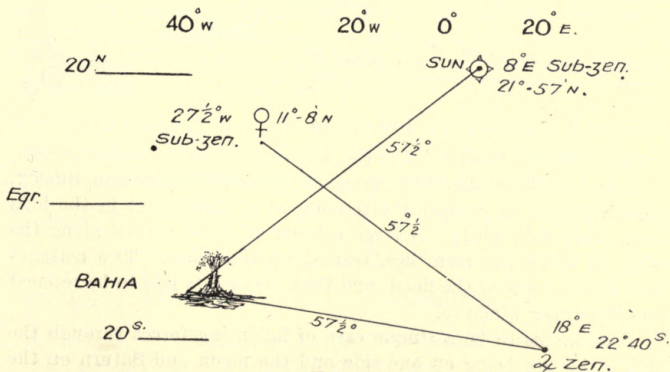


FIG. 16.

The example, now given, refers to a heavy rainstorm and cloud burst which took place at the island of St. Vincent, Cape Verdes.

The Island lies in the midst of the north-east trade winds and the weather is usually monotonously fine. This rainstorm was sudden and severe and caused a flood in the streets of the town as the water rushed down from the hills. I saw the water mark left on the houses at four feet high and heard that life had been lost.

This little storm, acting on a small island, is a simple non-complicated case. It came on about nine in the morning of September 19th, 1900, and lasted two or three hours.

Turning to September 15th, 2 hours G.M.T., we find that the moon is on extreme declination, and gives a warning, which the first diagram illustrates; the second diagram shows the solelectric position about ten minutes before the town streets were flooded.

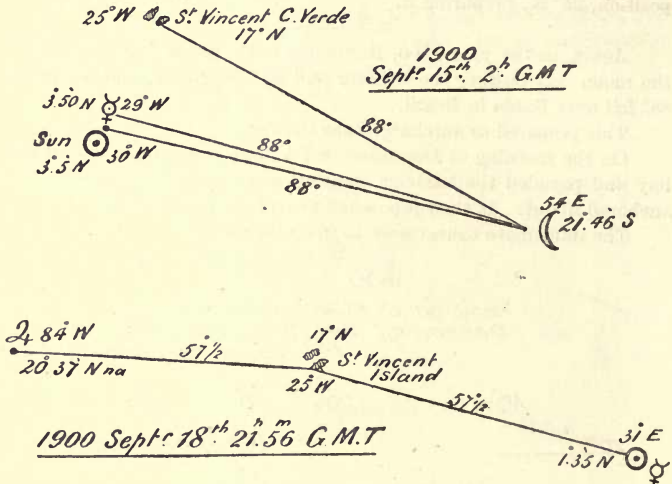


FIG. 17 & 18.

The "Times Weekly" has the following:—

Little Buckingham Farm, lying north-west of Shoreham, Sussex, was devastated on Saturday afternoon by a waterspout in the hills above (July 6th, 1901). A large column of water rushed along the valley in which the farm lies, tearing up the crops. Two cottages stood in the track of the flood, and their occupants had to be rescued from the upper windows.

This seems to be a simple case of balancing forces through the earth; the sun being on one side and the moon and Saturn on the other; the waterspout evidently was a necessary conductor.

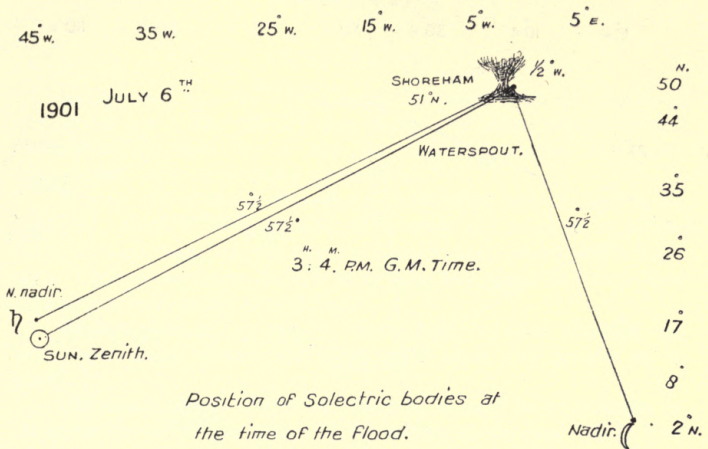
JULY 6TH 1901

FIG. 19.

Mr. Edmund Candler, British Press Representative with the Force in Mesopotamia, writing on April 13th, 1916, says :—

“ Yesterday afternoon we had a waterspout, a hailstorm and a hurricane. The spray was leaping 4 ft. high in the Tigris, and the Suwaicha marsh threatened to come in and join the river and flood our camp. About sunset it broke into our forward trenches and the Turkish position facing them ; a wave of water coming over the bund like a wall, swamping kit, rations and entrenching tools. Some of the Brigade on our right had to swim.”

The examples already given showing quick method of computing astronomical positions will be sufficient. The following are the positions for this example at the time stated in diagram :—

Zen. ☉	8° 40' N.	5° W.	☾ 16° 10' N.	110° E.	Zen.
Zen. ♃	4° 35' N.	12° W.	♄ 19° 29' N.	111° E.	Zen.
Sub. zen. ♀	24° 35' S.	39½° E.	Moon's Comb'n.		
Sub. zen. ♄	19° 55' S.	96½° E.	a ~~~~~ b track.		

Sun's Comb'n.

April 12 0 20 G.M.T.

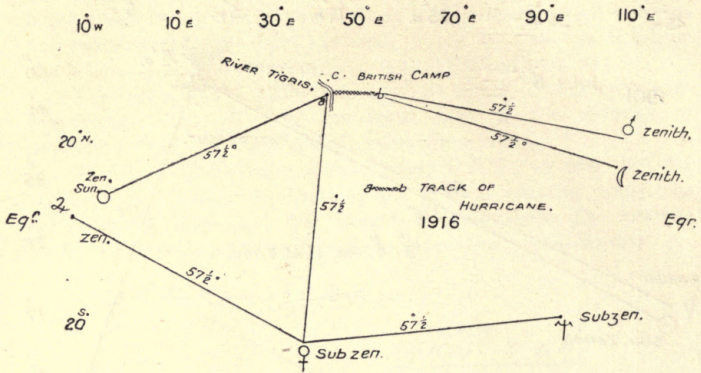


FIG. 20.

1916—HURRICANE AND WATERSPOUT, MESOPOTAMIA.

Position of solelectric bodies at 3.24 (h.m.) p.m. local time April 12th. Greenwich mean time April 12th 0.20 (h.m.) p.m.

The three planets at $57\frac{1}{2}^\circ$ developed a waterspout, and we see in this case a typical example of a sun's combination rushing across country to the moon's combination (when not too far distant) and thus causing a travelling hurricane.

The British camp was within the hurricane's influence, and with Jupiter's forces assisting much rainfall would take place.

Tempests.

CHAPTER IV.

Many years ago the writer began to search out the causes of storms at sea. The inquiry was pursued in many directions and resulted in the discovery of the causes, not of storms, but earthquakes and other interesting phenomena.

Storms and cyclones were the first attacked and the last to be captured. Gales of wind are difficult to locate and mark off on a time table, because they generally begin gradually, and extend over a large area. Cyclones are more definite as to time and place, and thus lend themselves more easily to treatment.

Earthquakes, which will be reserved for a future chapter, are also concentrated effects, and often leave their own records as to place.

Ultimately, by a system of analysis, it may be practicable to recognise the disturbing planet by the nature of the gale. Even now Jupiter can be diagnosed by the large area and continuance of a storm and by the amount of rainfall which accompanies it. The Romans did not designate him, Jupiter Pluvius, without reason.

Diagram (page 36) illustrates the apparent paths of sun and moon over the earth's surface.

The moon revolves thirteen times round the earth, while the earth is revolving once round the sun.

Jupiter is equal to any two other planets in power of soelectric action. Judged by effects on the earth, the planets take the following order in regard to soelectric power.

The sun is the source of supply.

1. The moon is of first importance.
2. Jupiter.
3. Venus.
4. Mars and Saturn.
5. Uranus and Neptune.
6. Mercury.

For purposes of calculation it is necessary to have certain bases to start from, whether the causes of a storm are sought for, or prediction is the object.

There are four starting places from which to begin the calculations, as may be noted from examples to follow :—

- (1) The first in importance is the position of the moon when she is within 1" (second) of her extreme declination north or

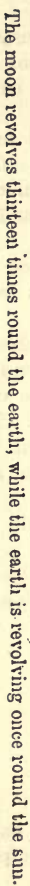


Diagram illustrating the apparent paths of sun and moon over the earth's surface.

south ; but even when five seconds from extreme declination the moon may give valuable warnings.

- (2) The positions of sun and moon when they are $57\frac{1}{2}^{\circ}$ from each other.
- (3) The positions of moon and sun when they are within 5' (minutes) of equator.
- (4) The position of sun or moon when a planet is from 2° to 3° from conjunction.

Plate 3 illustrates the motions in declination of sun and moon.

We shall now take some examples of storms and hurricanes and see how far they support the soelectric theory.

The small diagram of March 27th, 1905, shows that the country about Cairo was soelectrically charged when the moon attained extreme declination south. The moon moved only $0.4''$ of declination in 20 minutes, thus covering and charging a large area of ground east and west.

The "Times Weekly," 1905, contained the following :—

"A correspondent writes from Cairo on April 1st: A thunder-storm of incredible violence burst over Cairo yesterday afternoon at half-past 3. Rain fell in a perfect deluge, speedily flooding the streets to a depth of 3 ins. or 4 ins. in water. In low lying parts of the town the water was so high as to cover the axles of carriages.

"At about ten minutes to four, when the storm was at its height, the minor pyramid of Ghizeh was struck by lightning slightly below the apex of the monument.

"Several of the immense stones were dislodged, and rolled down with a terrific crash to the sands below. The place that received the shock looks like a gaping wound. No such accident has occurred within living memory. The storm itself was the most violent experienced in Egypt for the past 15 years.

Telegraphic communication with Suez was entirely suspended."

From this fine description it is evident that a first-class storm visited Cairo and district. We expect, therefore, to find both sun and moon in action, and some concentrated planet work to give the lightning effects. When a storm or disturbance happens between 3 hours and 4 hours p.m. it is generally caused by the sun's 57° position.

For the calculation we shall take the local time of 3 hours 24 minutes p.m. The pyramid is about 31° E., equivalent to 2 hours 4 minutes.

Another planet assists Uranus to send a more powerful soelectric current through the earth, that is, Saturn, whose position is in $13^{\circ} 3' S.$ and $57^{\circ} W.$ (fig. 22).

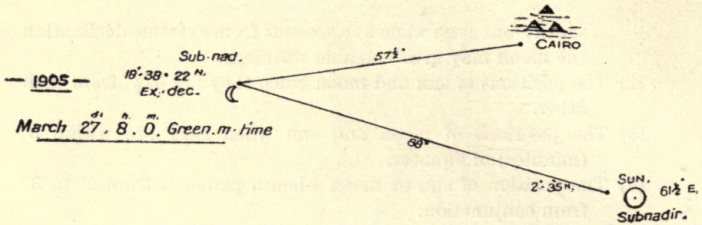


FIG. 21.

There was a warning on March 27th when the moon was on extreme declination (fig. 21).

This frequently occurs and is a valuable and considerate custom of the moon.

The nadir position of Saturn throws an arc of $57\frac{1}{2}$ over both Uranus and Neptune, and the calculation for position is as follows:—

3h. 24m.				Saturn's position = $\frac{13. \frac{1}{2} \text{ N.}}{123 \text{ E.}}$ nad.	
2	4 E.				
1	20 Green. M. T.	Moon's position	Na.	1. 53 R. A. Mer.	
0	33 Sid. Time.			22. 5 R. Asc. $\frac{1}{2}$	
1	53	12. 40 S.	12. 40 N.	20. 12 E.	
21	36 Rt. Asc. \angle	64 W.	116 E.	3. 48 W. = 57 W. Zen.	
19	43			13. 3 S.	
		$\odot = 4^\circ \text{ N. and } 20^\circ \text{ W.} = 1\text{h. } 20\text{m. G.M.T.}$			
4	17 W.				
Rt. A. Mer.	1h. 53m.	23. 37 S.	23. 37 N.	ψ 1h. 53m.	
18	18 $\frac{1}{2}$			6 23	
16	25	114 W.	66 E.	4 30	
7	35 W.			67 1/2 E.	
	114 W.			22. 22 N.	

Annexed is a representation of the relative positions of sun, moon, and three planets which caused the storm.

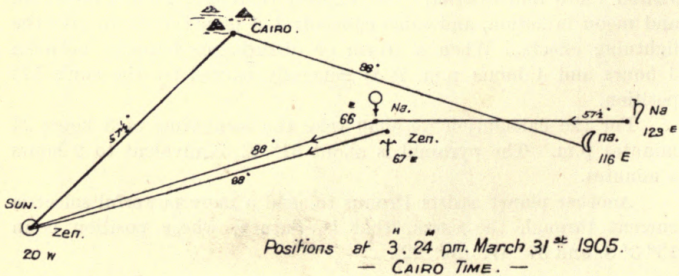


FIG. 22.

On the 2nd June, 1901, at 13 hours Green M. time the moon was in extreme declination $20^{\circ} 39' 25''$ S. long., $7\frac{1}{2}^{\circ}$ W., and the sun in $22^{\circ} 12' \text{ S.}$ and $15\frac{1}{2}^{\circ}$ W.

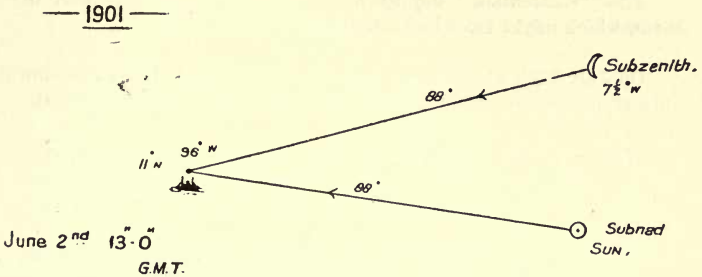


FIG. 23.

An area at 96° W. is becoming charged with positive soelectric force.

On June 6th the mail steamer "Guatemala" of the Pacific Steam Navigation Co. passed this very spot. Captain Harris, a most experienced man, told me that a storm of great force struck the "Guatemala" about 2 h. a.m. on the 7th, so that it was necessary to nurse the ship and reduce speed. The remarkable feature was the blinding lightning, and the deafening thunder made it impossible to hear one's own shouting for two hours.

Evidently a relief combination had arrived over the charged spot simultaneously with the "Guatemala."

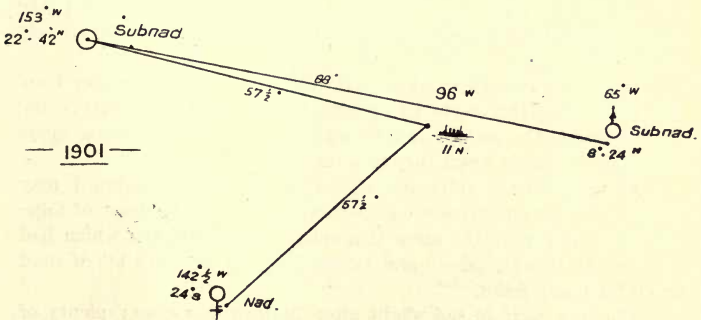


FIG. 24.

Solectric positions at 3.48 a.m., local time.

The storm finished in heavy rain, and equilibrium was established after this violent interchange of solectric forces.

The "Guatemala" happened to get near the central part of storm, which might have had a radius of 3° or 5° .

On July 20th of the same year the writer encountered a terrific tempest, and steamed 300 miles towards the centre, which lay off the west entrance to Straits of Magellan.

With the hope of entering the Straits before night, the ship was steered to within two miles of the land, which was difficult to recognise. Between the snow squalls, however, Cape George was seen, ship rolling 50 degrees.

Suddenly the storm developed a furious intensity and continued as a lasting squall; sea spray, snow and hail sweeping along in blinding sheets.

It became now a question of safety alone, so the ship was headed off the land, to the westward. For the first time in my experience I found that the ship could make no progress against the gale, though a heavy powerful steamer. The reason was that the sea had risen so vertically and as high as 60 ft., that the propellers could not be kept in the water. So for many hours we tacked out with sea at an angle, and each one breaking over the decks.

And thus we battled on that Sunday night. Next day, after watching an opportunity to turn the ship safely amidst the huge seas, we steamed into the Straits, and stood upright once again in smooth water. I find that on the 21st a second storm reinforced the first and we were near the centre of disturbance.

Below are given two diagrams explanatory of this gale; the second diagram shows that a second combination fell over the already raging district.

When the moon's combination concentrates at a distance from the sun's, then the storm or cyclone travels across the intervening space towards the moon; if the two combinations are not far apart the result is usually great fury in a small area.

To instance the intensity of the storms in this region I may remark that on one occasion I rescued 21 men off the coast of Cape George. They were the crew of a small French steamer which had been bodily thrown ashore and smashed up on the only bit of sand beach for many miles.

The crew were in sad plight after 30 days in a cave; plenty of water but scarcely any food. They had lost count of time and some were losing reason.

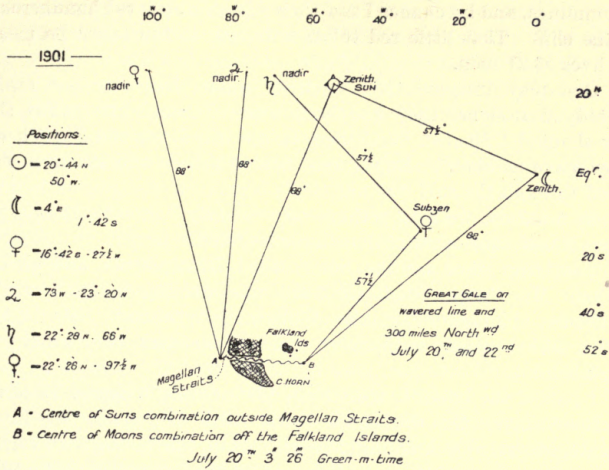


FIG. 25.

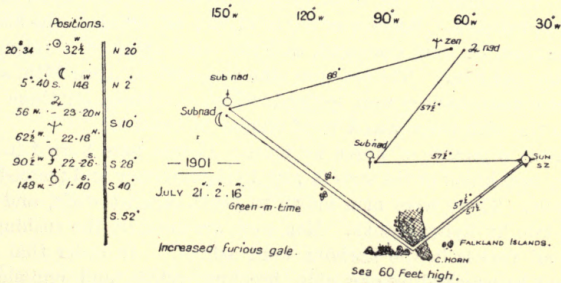


FIG. 26.

I had gone in close to the dangerous shore that day to get a line of soundings, and by chance I saw their signal, a little red handkerchief on the cliff. That little red token fluttering in the telescope meant the lives of 21 men.

One may imagine their emotion when they saw our ensign hoisted, as a signal they had been seen. I heard afterwards that they shouted "English flag! then we are saved, for the English will never leave us here." Ropes were floated ashore and the men were pulled through the surf into our ship's boat.

As a nation, we may perhaps be "muddy" in some things, yet I have found that other nations have confidence in us.

Near this place are the Islets called Evangelistas, and on one of them Mr. George Slight in 1896 was erecting a much needed lighthouse, by order of the Chilian Government. Mr. Slight carried out a great work there and a dangerous one, worthy of knighthood

I passed the Islet on April 19th, 1896, during a gale, with heavy sea increasing. On the night of the 20th the crane for lifting weights, stores and building material from the boats, was carried away. It was embedded in solid rock on the Evangelista Islet 50 ft. above high water mark, when a wave swept over it, and it was not.

The next example is an East Indian cyclone or hurricane, and the first diagram shows two preliminary hints as to what was coming.

There was an intimation of the coming storm 11 days previous to the event, and again a warning with magnetic disturbance four days before.

The great Mauritius hurricane which occurred on the morning of April 29th, 1892, caused the death of 1,200 persons and injured 4,000. One-third of the town of Port Louis was destroyed and 24 churches wrecked. Barometer fell to 27.95; all vessels in the harbour went ashore, or were damaged, and the wind attained a velocity of 112 miles per hour. The sea rose nine feet, and on April 25th, strong magnetic disturbances were noticed, which continued for three days, and on the 28th there was a vivid display of lightning.

What a picture of Force let loose. People were buried in their houses, men killed in the streets with flying masonry and pierced with iron rails. There were men blown to death against walls, and trees cut in two by flying planks. Men were drowned by the rushing sea, and "all vessels in the harbour went ashore." In order that ships may not be wrecked by one ship breaking adrift and endangering the rest by collision, all of them are moored head and stern and to each other. At any rate, during my visits that was the custom.

Right well were they moored in /92, for they all went ashore together in this instance.

And with that picture of wild violence in memory what can we say to professors and teachers who still instruct us that the cause of storms is a heated atmosphere !

"The air becomes heated by contact with the ground and rises, then cold air replaces it and causes wind."

Sometimes we are told that contrary currents blowing alongside each other produce storms.

An excellent scientific work on other matters twaddles thus :—
"Causes of Winds.—Winds are produced by a disturbance of the atmosphere : a disturbance always resulting from a difference in temperature between adjacent countries."

In that most lovely island, Mauritius, the ground is usually hot and so is the air, but hurricanes have absented themselves for a whole year at times. Why the vivid lightning the day before and during the hurricane, if it were merely a question of heat.

Solectrics may help us ; and a captain learned in the theory would in April, 1892, at the Mauritius have become anxious, after noting the hints conveyed by the positions on April 17th and 24th.

On April 17th, 22 hours 53 minutes, the moon was at extreme declination, $27^{\circ} 18' N.$, $88^{\circ} E.$ nadir, and on the 24th, 12 hours 18 minutes, the moon close to the equator was in conjunction with Jupiter.

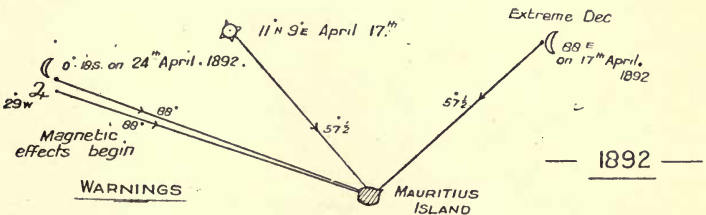
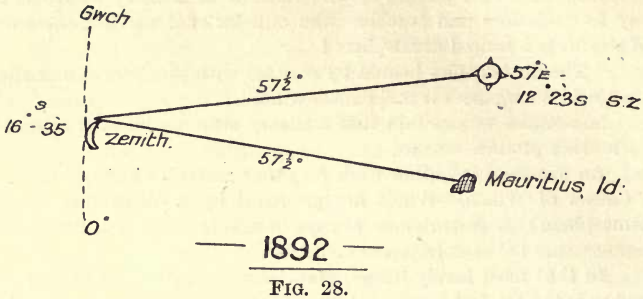


FIG. 27.

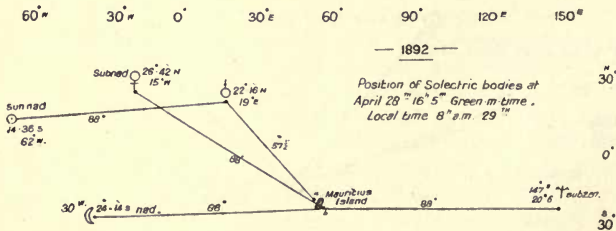
The captain's next step would be to find the solectric positions when sun and moon were $57\frac{1}{2}^{\circ}$ from each other. This happened on April 21st 20 hours 10 minutes Green. mean time.

• WARNING •



As the island still appears to be threatened, it is prudent to calculate positions for the time when moon is 88° from Mauritius, because at that time the hurricane will develop. That time is found to be by calculation April 28th 16 hours 5 minutes Green. mean time.

The captain on drawing the diagram below to scale would discover the exact date of hurricane's arrival and that it would pass over the harbour. When masts have been sent down, moorings examined and fenders put over, I consider nothing more can be done than to provision a boat, land the crew and camp 50 ft. above sea level, and there await results. No useful work can be done during the hurricane.



MAURITIUS HURRICANE.

The hurricane is in progress from (a) sun's combination on west side to (b) moon's combination on east side.

The next example is from the China seas.

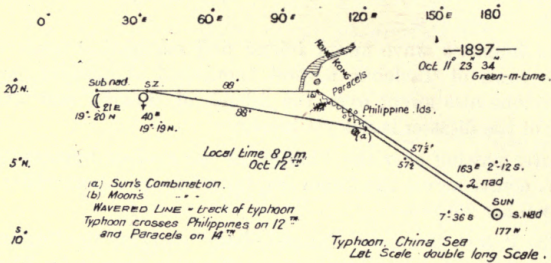


FIG. 31.

The typhoon started at (a) on October 11th, to the eastward of the Philippines, struck the Islands on the 12th and part of 13th, then passed over the China sea, meeting the P. & O. steamer off the Paracels on October 14th, to finish at (b), or further west.

The next example is that of Galveston, where 10,000 people were killed by the hurricane of September 8th, 1900.

The coasts of Louisiana and Texas suffered dreadfully, also the towns near the sea. The water of the Gulf rose so high that many inhabitants were swept out to sea by the floods which inundated the towns, and thousands of buildings destroyed.

Such a serious tempest was certain to give warning, therefore, we refer to September 2nd, thirteen hours, at which time the moon was at extreme declination.

Moon's extreme declination is a convenient basis for calculation, but it is not very accurate. It is advisable to allow time for a movement of two seconds either way. One reason is that the Nautical Almanac does not give the moment of moon's arrival at greatest Declination; it gives the declination for each hour. Sometimes the moon hangs an hour on highest declination thus charging a large area as the earth

rotates under it and giving only a vague intimation as to place of a coming disturbance. Therefore, when the basis of sun to moon $57\frac{1}{2}^\circ$ can be used, it is a good confirmation. Perhaps in the future we may find a rule which will hold good at the time sun and moon's distance is 88° .

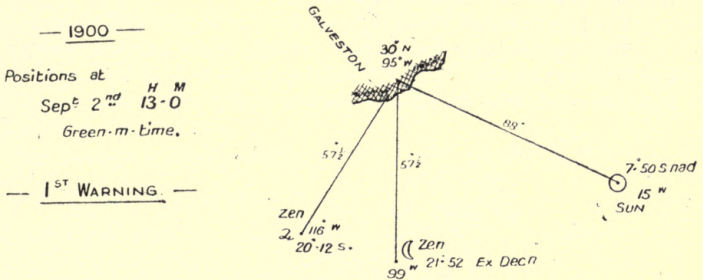


FIG. 32.

1ST WARNING.

MOON AT EXTREME DECLINATION.

But now, Nature sends us a very definite warning when sun and moon are at $57\frac{1}{2}^\circ$, for their violent arcs cut right over the Galveston area.

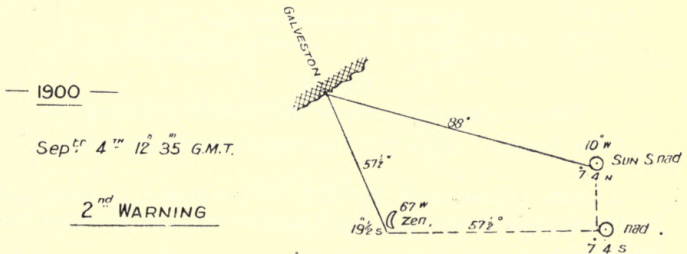


FIG. 33.

2ND WARNING.

The next diagram shows the disposition of the soelectric bodies when the hurricane has developed full force—which lasted from 6 hours p.m. until 9 hours p.m. local time.

The sun's combination centres to the eastward of the moon's arc of 88° which is assisted by Mars, and curves along the coast of Texas. There are four planets joined up with the sun so that enormous

solectric force is rushing along the coast following the moon's curve. A "tidal wave" was reported of over 15 ft. No doubt there was an earthquake during the hurricane as all soelectric bodies were engaged excepting Mercury and Venus, and the coast would sink and rise again with a wave motion. The wavered line ~~~~~ on diagram shows the track of the storm.

The two warnings were very good both as to time and place.

This terrible hurricane is a fine example of the soelectric theory ; and it shows also that the 10,000 had time to get to high land, or away from the coast, after the decided warning on September 4th.

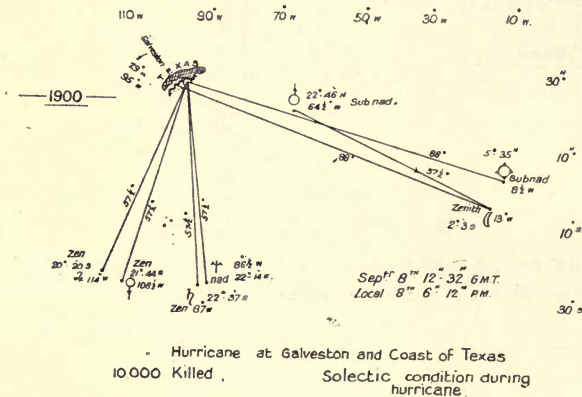


FIG. 34.

HURRICANE AT GALVESTON AND COAST OF TEXAS.

10,000 KILLED. SOLECTRIC CONDITION DURING HURRICANE.

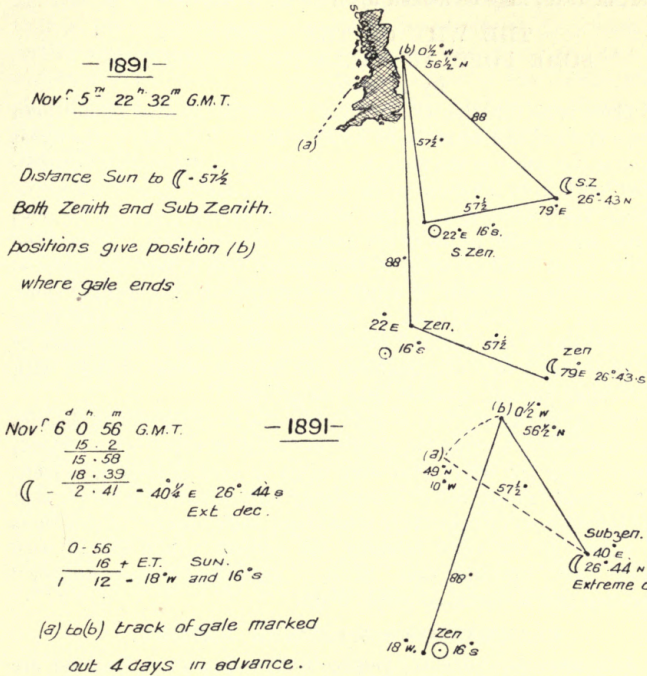
A large volume could be filled with examples of gales and hurricanes which have been gathered together during a long search for their causes.

A typical English storm and a Newfoundland blizzard will, however, conclude this chapter on tempests.

On November 11th, 1891, the writer was held up in the good ship "Galicia" by a furious gale—the centre of which passed up St. George's Channel and on past the Firth of Forth, barometer 28"·30.

Leaving Liverpool early on the 12th for Bordeaux the voyage was sufficiently lively to enable me to support the evidence of its force which may be gathered from the "Times" chartlet annexed.

On November 6th, 1 hour p.m. the moon attained extreme declination, and the diagram will show, on comparing it with the chartlet, how accurate this warning was, four days in advance.



FIGS. 35 & 36.

The gale started on November 10th, 1891, in 47° N. 13° W. by calculation, as the sun crossed there with Jupiter and Mars at 6 p.m.

Before leaving this subject of tempests it will be advisable to state the general opinion of meteorologists on weather; so that the reader can decide from the clearness of their explanations the value of the arguments of authority, and weigh them against the solecistic theory in the balances of common sense and mathematics.

Meteorology must take her place as the most ignorant of all the sciences, and blush until new men smash the barometer as the founda-

tion of weather knowledge, and treat it merely as a stone in the structure ; so thinks this writer.

The following article taken from the "Chronicle," a London paper, in 1910, may be looked upon as up to date :—

THE WHY OF THE WEATHER. SOME POPULAR FALLACIES CORRECTED.

By A Meteorologist.

There is no question that for one reason or another all northern Europe this summer seems to be weather mad. The man in the street as well as the talker in the morning train who does not know a meteorological hawk from a handsaw, has his opinion about what is called the unusual, the unprecedented, the abnormal weather, though he does not use such polite terms in his damning classification. Within the last two years the disposition of the average man to seek for causes—ever a fascinating pursuit, in which for centuries the unoffending moon has played the leading part of suspect—has led to his connecting every terrestrial and celestial event from the Messina earthquake of 1908 to Halley's very disappointing and fatuous comet of 1910, with the so-called peculiar weather that has prevailed.

The extraordinary fact is that while the most ridiculous theories are complacently accepted in circles intelligent in every other respect, meteorologists the world over were never in such general agreement as to general causes, and it is especially unfortunate, therefore, that while the science of meteorology is assuming somewhat of the exactness and surety of the sister sciences, the general public should with avidity take up the very latest "moonshine-from-cucumber" suggestion and accept it as gospel truth.

FLAMMARION'S WEATHER THEORY.

Just now, for instance, people in France and in England are becoming excited over the explanation given out as positively new, original, and startling by Camille Flammarion and his followers, that the weather of western Europe is brewed in the United States, and that the recent cold and wet spells in France and England are a direct result of the prevalence of hot waves on the North American Continent. All this has been set out with much pomp and circumstance of cabling back and forth to America, with the publication of much newspaper comment, foreign and English, which would seem to indicate that the new theory was a contribution of weight which called out for a suspension of judgment on account of its great and momentous novelty.

Now, sometimes even scientific patience ceases to be a virtue, though the admirable British restraint of the Meteorological Office

enables it to survive another flurry of flighty science without even taking time to explain the explanation. Since, however, so many people are taking the latest Flammarion theory seriously it seems to me that it is time to say that, whatever was seemingly novel in it, that is, the eastward drift of weather, is not new at all; while the further development of this supposed novel theory into an exact and reciprocal relationship between the hot waves of the United States and the cold, wet summer of the European Continent, is simply mis-stating a condition well understood by any American or European meteorologist of any standing.

The real gist of the weather situation is this, and it should reassure any French or English citizen who fears any American invasion other than that of dollars :—1st : It is eternally true that all the weather movements in the Northern hemisphere north of the Tropics come from west to east ; 2nd : That in the North Atlantic Basin specifically the hot waves in the United States and the wet weather in France are the result of the very same predisposing cause. This predisposing cause, which in the United States manifests itself in the form of a hot wave, and in these latitudes in the form of the prevailing moisture-laden oceanic winds, is the very familiar tropical high pressure area, or, as it is called in the terminology of the meteorologists, the Atlantic anti-cyclone. The hot wave in the United States, therefore, does not cause directly or indirectly a contrasting state of weather in Western Europe, since it is itself an effect of the general condition, but the abnormal weather there and here—hot and moist, and cold and wet—is simply due to the persistence of high pressures in the sub-tropical belts of the Gulf States and the Mid-Atlantic.

THE AERIAL FLOW LINES.

So long as these pressures continue high in the Gulf States and over the Atlantic from the Bay of Charleston to Spain, so long will there be set up over the United States the deadly south-to-north aerial circulation which is always the factor and feature of the American hot wave. And so long as these high pressures tend to become "fixed," as the phrase goes, to the South of England and central over the Azores with more or less excessive seasonal pressures, so long will this belt of high pressure—the Atlantic anti-cyclone—cause westerly winds over western Europe with all the consequences noted this year and last, as the moisture-laden winds reach regions favourable for condensation.

Moreover, when, as so often happens, these Atlantic high pressures, which are great aerial vortices with downward and outward motion, show little oscillation in their centre (as has been true recently

as revealed in the splendid hydrographic charts of the Meteorological Office for the week of June 30th to July 6) they also tend to hold up the more brisk easterly movement of the great travelling eddies (cyclones and anti-cyclones) and prevent those variations in weather changes which give variety and relief from a too long reign of either wet weather or of hot waves.

Now, one of the most fascinating chapters of meteorology is that which reveals the globe as surrounded by an envelope of air, everywhere acting and re-acting, so that there is no part of the globe that is not in direct relation with other portions; and, particularly in the northern Hemisphere, there is nothing so absorbing as the study of the great circum-polar swirl from west to east from Asia to the Pacific, and from the Pacific to the North American Continent, from the North American Continent to the Atlantic, and from the Atlantic to Europe, and so on around. And it is the changes in the path of this great swirl, the variations in the aerial flow lines, that bring about those variations in climate and in weather from year to year which seem so inexplicable. Moreover, the changes in the paths and the character of this swirl, whether sluggish or more rapid, or more northerly or more southerly, are determined entirely by the varying pressures of the great sub-tropical rings of high pressure. All this is true of the south temperate zone, and of the tropical interdependence; for instance, of Australia and India and the South African seas and the Arabian seas, as Douglas Archibald and other British meteorologists have long since pointed out.

What meteorologists of to-day are therefore engaged in clearing up is not the connection between the weather all round the globe (since this is revealed every day in the synoptic charts of the whole Northern Hemisphere prepared by the United States Weather Bureau and in this country's weekly charts, as well as in the German and French publications), but in finding out the cause of these yearly variations of pressure, which are of such importance to the great civilised nations that live in the northern hemisphere, and whose crops and business are affected by the extremes which are possible in any given year, as we all know to our grief. And it is to such problems that men like Lockyer and the United States Specialists under Willis L. Moore have devoted and are devoting their attention.

THE GULF STREAM MYTH.

Unfortunately, so far as the public is concerned, the question as regards the weather from the North Atlantic is much confused with

erroneous popular theories and ignorant folk beliefs, and particularly with one delusion that the familiar and altogether too famous Gulf Stream is the cause of every weather change, and it is because of this confusion, despite the facts available to any student, that the last suggestion of Flammarion is apt to confirm popular error and make a needless mystery of European weather changes.

Even to-day in England and America, and especially among those who travel on the high seas, there is nothing that is referred to with such complacent acceptance as the idea that the Gulf Stream, *per se*, gives England its climate, as well as doing a thousand and one wonderful things in America and the open Atlantic. The careful work of Professor H. N. Dickson, of Oxford, of other weather specialists, and of all modern physicists, is of no avail against this opinion, and it will seem heresy to most to say that the Gulf Stream, in itself has no more effect on the climate of England than the weather vane of St. Clement Danes ; nor, indeed, have the hot waves in the United States any such immediate and pacific effect as has just been suggested in France. England will continue to have a climate at times of the "unvexed Bermoothes," and the United States its hot waves so long as the Atlantic high pressures maintain their positions which they have had for thousands and thousands of years.

The actually new thing in meteorology is the fact that world-wide conditions are being rounded up every day by means of cable, land lines, and wireless telegraphy, and that we are on the eve of a great international development of forecasting, which will be of inestimable value to such countries as England and France, which lie in this great eastward swirl of the north temperate zone circulation.

And the newest fact of all is that the variations in this swirl are not due to local conditions in the United States and elsewhere, but to variations in the sub-tropical pressures, and these variations, as Lockyer has pointed out, are not due to local conditions on the earth itself, but to yearly and long-range changes in the solar radiation.

HARVEY M. WATTS.

Does this "Why of the Weather" make us weather wise.

Does it account for cyclone or blizzard ; cold snap or heat wave ; drought or local shower.

If in doubt we are told to admire the "meteorologists, American or European, of any standing" ; also we should be comforted by thinking of the "Atlantic Anti-cyclone" which has maintained its "position for thousands and thousands of years," and continued to give us a climate of unvexed Bermoothes.

Professor H. N. Dickson, M.A., D.Sc. Oxon., in "Climate and Weather" (1912), page 104, says :—

"The mechanism of cyclones and anticyclones is still far from being understood. Observation shows that each cyclone has an anticyclone, and each anticyclone a cyclone, not directly above it, but somewhat to one side ; but the originating cause is certainly not convection.

"It is well at this point to recall the extreme complexity of the conditions. We have as a result of the temperature gradient, a tendency for (1) an upper current of warm air to move towards the poles, and (2) an under current of cold air to move towards the equator. The former, which in the end must supply the latter (as a return current) is (3) driven back into lower latitudes by the forces due to the earth's rotation.

"We can well imagine that where all these forces are vigorously at work, one current will not flow peacefully over the other, but that constant breaking up and down into streams or "streaks" will occur at various levels, so that streams may flow in opposite directions side by side, setting up vortical motion along the face between. Recent investigations go to show that the cyclones and anticyclones are eddies" in the larger streams, and that the winds at the earth's surface are not in the first instance merely connecting currents whereby the air descending in an anticyclone is fed into the up current of the nearest cyclone.

"This generalisation (due chiefly to Shaw & Lempfert) is perhaps the most important contribution which has been made to meteorology in recent years.

"Its significance is so profound, and the difficulty of fitting its consequences into the existing theories of the planetary circulation so great, that we make this attempt to summarise the results so far obtained with much hesitation.

(By planetary circulation is probably meant atmospheric circulation over this globe.—*Author.*)

"Perhaps it would have been better to say—nothing is known with certainty about what the circulation would be if there were no land or no sea. But an account of weather and climate would then have been reduced to the monotony of mere description ; it would have been extremely difficult to make it intelligible, and impossible to give any clear indication of how the slow growth of knowledge in meteorology has been brought about. Simple as are the elementary physical properties of air and water vapour, the fact that they include compressibility makes a general investigation of their behaviour on a rotating sphere, even with the simplest assumptions as to temperature, quite beyond the powers of known mathematical methods."

In other words, Professor Dickson, M.A., D.Sc.Oxon., the President of the Meteorological Society, gives it up.

The profound "generalisation due to Shaw and Lempfert" that cyclones are "eddies" set up between atmospheric streams flowing in opposite directions seems to have knocked the subject into chaos.

I am prejudiced against profound and stately sentences, meaning nothing; indeed, after the above confession there is little to criticise. In the "Why of the Weather" there is a statement, however, which must be attacked, because it is considered to be a first principle in modern meteorology.

Mr. Harvey Watts says:—First. It is eternally true that all the weather movements in the northern hemisphere, north of the tropics, come from west to east.

Now that is a plain statement devoid of the hedging embroidery so much beloved by scientists, therefore it must be fought and destroyed, and given an honourable burial.

To do this an actual example of a storm which did not come from the westward will be given. Moreover, none of the warnings which a seafaring people look for, such as the aspect of the sky and clouds were in evidence; nor were any storm warnings sent from weather offices. The storm came nevertheless and developed into a blizzard, suddenly, and during a beautiful morning, which deceived everyone. The first intimation was a cloud rising in the north-east.

But below is the account from St. Johns, Newfoundland, much abridged, for each boat that escaped had an exhausted and frost-bitten crew.

THE NEWFOUNDLAND DISASTER.

1892.

A TERRIBLE STORY.

A St. John's correspondent of the London "Chronicle" writes:—

One of the largest of those great estuaries which pierce the iron-bound eastern coast of Newfoundland is Trinity Bay. It is a magnificent sheet of water. Its mouth, opening towards the north-east, is 40 to 50 miles wide, and its entire length is over 80 miles. Its numerous arms stretch far inland, carrying the finny tribes within reach of the fisherman's net and line. Some 18,000 people cluster around the shores of this great bay, their fishing stages, hamlets, villages, and little towns being erected on its harbours, creeks and coves. They are nearly all fisher-folk, and derive their subsistence from the harvests of the sea. The men are, in the main, fine types of our bold, hardy toilers. Many of them each spring brave the dangers of the icefields in pursuit of the seal. Many hundreds spend three

or four months each year in fishing for cod on the shores of "that great and terrible wilderness," Labrador, amid privations and hardships which only the hardiest could endure. Others seek the fog-covered Banks, far out in the wild Atlantic, and others ply hook and line in the waters of their own bay. They have but a scanty supply of this world's goods, and it requires all their efforts to keep the wolf from the door.

The most populous town is Trinity, situated on the northern shore, about 20 miles from the mouth of the bay. It has a magnificent harbour, one of the finest in the world. The morning of Saturday, February 27th, dawned on Trinity calm and beautiful. It was one of those rare days which sometimes come in mid-winter. The sun shone out of a cloudless sky; the bright waters of the bay reflected its beams, and the air was almost balmy. In the distance numbers of glittering ice floes were visible, but the greater part of the bay was open water. Who could imagine that a day so beautiful was to end in tempest, terror, suffering, and death in its most awful form?

For several days before numbers of seals had been seen in the bay, some of which were shot and brought in. When then this calm, bright morning came it was hailed with joy as most favourable for the seal hunt. The eager hunters were astir early, and so anxious were they to be in the van that many of them hardly waited to swallow a hasty breakfast, and hurried away, but thinly clad, in their little boats. Already the crack of the guns from the boats earliest out could be heard. Soon from Trinity, Green Bay, Ireland's Eye, and the neighbouring settlements, the boats glided out one after the other till hardly a man fit for the hunt was left on shore. In all over 220 men were afloat in little punts. No one dreamed of danger. They expected to be only a few miles from the shore, and to return in the afternoon. Few took with them even a small supply of food. But those who chanced to be watching the sky as the forenoon advanced, saw away in the north-east a dark cloud gathering. With inconceivable rapidity the cloud masses piled themselves together and overspread the sky. Then, in a moment, the tempest came, struck the now darkened waters, and in a few minutes converted the placid bosom of the bay into a hissing, seething cauldron. The awful blizzard had burst forth. The temperature fell 40 degrees and touched zero. The fierce cold, with a piercing wind, seemed enough to freeze the very blood in the veins. Gust followed gust, each more furious than the last. It was, indeed, an agonising sight which greeted the eyes of mothers, wives, relatives and friends on shore, when, hearing the roar of the storm, they rushed out of doors, and from the heights tried to make out the boats in which so many of their loved ones were

struggling with the tempest. No human help could reach them now, and how could boats live in such a storm?

It was but 11 o'clock in the forenoon when the tempest, with hardly any warning, burst upon the fishermen. The boats were then several miles from land. The direction of the wind was such that to reach the shore from which they had taken their departure they must row right in the teeth of the storm. The majority saw this to be impossible. The terrible alternative was to run before the wind towards the southern shores, now blocked with ice, with the danger of being swamped every moment, or perhaps driven out to sea if the wind shifted, or dashed to pieces amid the ice. Six of the boats' crews who were nearest the north shore took the desperate resolution of facing the storm, hoping to be able to land at the Horse Chops, a projecting point of land, the extremity of the bight on which Trinity is situated, and not far from their homes. Then began with them a terrible struggle for life. Slowly and painfully they were lessening the distance between them and the shore, keeping as close together as possible for mutual help. Suddenly a cry of despair was heard from one of the boats. The oars had snapped, and she was drifting away to certain destruction. There was not a moment's hesitation. The nearest boat went to her aid, and after desperate efforts got her crew on board, though it seemed as if the additional burden must sink her. But the brave men never weighed their own safety against the lives of their perishing companions. Soon after this generous deed, one of the rescued men died of cold and exhaustion. The ice began to form in thick masses on the sides and bottom of the deeply-laden boat. Another hour was passed in the terrible struggle for life, when a second of the crew was seen to drop his oar, though his arms continued to keep time with the stroke for a few moments, and then he fell forward and breathed his last. He proved to be brother to the one whose remains had already been given to the sea.

The storm continued to rage in full fury during Saturday night. The scenes of distress and agony in the homes of the still missing men may be imagined. It is marvellous to find that so many reached the southern shore alive after passing that terrible night in the bay in a temperature below zero and a piercing north-easter blowing. Only men of iron could have survived, and their sufferings were appalling.

About noon on Sunday, a woman at Heart's Content, on the south shore, happened to notice some boats at a distance, apparently drifting past, the crews exhausted or frozen. Rescue parties were at once formed, who succeeded in forcing their boats through the ice and bringing in 17 men, some in the last stage of exhaustion. They

the waves were breaking over and dashing against each other. Some of the rescued, though benumbed and exhausted, were not seriously injured. Others were badly frost-bitten.

The dead whose bodies were brought ashore numbered in all thirteen. The scenes of grief at their interment were heartrending. Another of the rescued men died two days after reaching the shore, making fourteen in all. But it was found that eleven more were still missing, and all hope of their being picked up had soon to be abandoned.

There was a soelectric warning four days before this storm developed. Fig. 37 shows the positions at the time when the moon was at extreme declination South. Moreover, the moon's combination marks the starting point of the storm in about 53° N. and 43° W. to the N.E. of Newfoundland.

Fig. 38 shows the soelectric positions at about 11 a.m. when the storm was noticed—Greenwich time, February 27th, 3 hours.

The sun's combination now marks the starting point, say, $54\frac{1}{2}^{\circ}$ N. and 45° W., and a combination of four planets marks the end of the gale's track.

The fact that this gale and its track can be calculated, 24 years back, proves that with the aid of the Nautical Almanac storms can be calculated ahead with equal precision.

I chose this example because the details were known to me; it was in the northern hemisphere; it was a severe storm, and unexpected by experts living by the sea. Moreover, this dreadful storm came from the eastward; therefore the statement: "It is eternally true that all the weather movements in the northern hemisphere, north of the tropics, come from west to east," is not eternally true.

Were I upholding the atmospheric circulation theory, founded on the barometer, and had learned professors been able to calculate the two accompanying diagrams, I should feel that my case was hopeless, and quite beyond my "powers and mathematical methods," to use Professor Dickson's words.

In the last example we see that many brave and expert seamen lost their lives in a cruel manner because they were unable to foretell the coming of a storm twelve hours in advance.

We know from the extracts which have been quoted above, that the most eminent meteorologists of the day believe that "all the weather movements in the Northern hemisphere north of the tropics come from west to east." Consequently had these scientists been at Trinity bay on that beautiful morning of February 27th they would

have suspected no danger, whereas in a few hours 220 fishermen were struggling for life in a blizzard.

I could recite many examples in my own career of the practical value of the Solectric theory, but this is not a biography so one incident will suffice.

Being in charge of the troopship "Orissa" during the South African war period, I sailed from St. Helena for Cape Town on September 18th. A study of Solectrics warned me that a heavy gale was preparing to visit Table Bay on the 22nd and 23rd, so I informed the military officer that the troops would probably not disembark before the 24th.

We arrived on the night of September 22nd to find a heavy sea running and a strong wind from the north-west.

At daylight I signalled the ship's arrival and proceeded north to Robben island, about 8 miles distant. We anchored close under the lee of the land in comfort. During the night we could gauge the severity of the storm by the sea spray which enveloped the island and us; and dimly came the sound of troubled steamers blowing their whistles to avoid collision.

We were wise to seek shelter before the storm developed. Below is a cutting from a Cape Town newspaper of September 24th.

TERRIBLE WEATHER AT SEA.

SHIPPING IN DANGER.

The north-westerly gale which began to blow on Monday 22nd last showed no signs of abatement yesterday, and several exciting incidents were witnessed in Table Bay, where the sea was running very high. The mail steamer, the "Kinfauns Castle," arrived off Robben Island at five o'clock yesterday morning, but so terrible was the force of the hurricane that she was unable to round the Breakwater, and was compelled to head out again for the open sea. She made another attempt to enter the Bay about 11 o'clock, this time successfully, and cast anchor under the lee of the Breakwater, where there was some measure of protection from the violence of the sea. It was still found impossible to land passengers, however, and it was quite out of the question for her to attempt to enter the Dock. At 3 o'clock in the afternoon a tug went out, and the basket apparatus, in common use at Durban and Port Elizabeth, was brought into use for the first time for many years in Table Bay. By this means the passengers were all safely landed.

The White Star liner "Afric," from Australia, anchored off Mouille Point at an early hour yesterday morning, but observations from shore showed that she was in a very dangerous position, and two of the Harbour Board tugs put out to her assistance, towing her out to sea. The "Afric" made three subsequent attempts to round the Breakwater, all without success, and after failing to enter the Bay at 5 o'clock last night she once more turned her head seawards, and stood out for the open.

Table Bay is dangerous during northerly gales as the ships swing with their broadside to the waves. Five steamships were compelled to put to sea for safety at this time.

Earthquakes.

When dealing with cyclones and other wind storms, the investigator has a more difficult task before him than that of unravelling the causes of earthquakes.

Hurricanes and such like tempests usually increase gradually, and travel from their place of origin. That is to say, they may cover a large area and occupy a long time.

Earthquakes, although they may affect large areas, usually occupy only a short time, and the few minutes of greatest violence can generally be noted. The element of time being thus more exact for earthquakes, their causes can be more easily deduced. The seismograph is very useful as affording an exact record of the time and intensity of earthquakes.

The speed of seismic waves along the interior of earth's crust is calculated at about 2 miles per second, and seismologists state that tremors pass right through the earth diametrically at the rate of 6 miles per second. The San Francisco earthquake wave of 1906 travelled to Tokyo, Japan in 11 minutes. The distance is 4,720 miles across the Pacific Ocean, and this gives an average velocity of about 7.2 miles per second.

Earthquakes, it appears, despatch three sets of waves from the seat of disturbance; one set passes through the earth diametrically and one set passes round the earth in an easterly direction, and the third sets in a westerly direction.

These tremors being recorded, it is often possible to state the locality of the disturbance before the event has been telegraphed in the ordinary way of news.

From what has been stated in regard to the general theory of solectric force it would be surprising if no tremors which had passed through the earth had ever been recorded because the effects of the nadir position of the sun and planets are as remarkable as those derived from their direct positions.

It is worthy of note that the diametric tremors travel with three times the speed of the waves near the surface.

A high temperature reduces the electric conductivity of all substances. A high temperature also diminishes magnetism; for example, a magnet, if subjected to a red heat loses all its magnetism, nor does the magnetism return when the magnet cools. This shows that heat destroys magnetism.

If the interior of the earth were in a state of incandescence, neither the solectric force nor the diametric tremors could pass through

the earth, whereas it is certain that electricity passes through the earth in all directions.

There is, therefore, every reason to think that the earth is not constructed with an incandescent central portion.

Earthquakes are caused by a concentration of soelectric forces on some small area at or near the earth's surface; volcanic eruptions have a deeper origin but are caused by the same concentration continued over a length of time, and at intervals, and are usually marked out at the time of sun's crossing the equator.

It has been demonstrated by experiment that when an insulated sphere of conducting material (such as our earth is) is charged with electricity, the electricity passes to the surface and forms there a very thin layer, and it is considered that the distribution of electricity depends on the extent of the surface and not on the mass of a sphere.

All hollow iron bodies, for example, whether globular or square, as soon as the thickness of sides has reached to one-tenth of the diameter of the whole body, the magnetic effect is the same as if the body were solid, but in the earth we have to reckon with forces which pass diametrically also.

It is probable, that the crust of the earth is not affected by earthquakes deeper than 100 miles, and that the surface layer of magnetism of the earth coincides with that portion of the earth's crust which conducts the outer circulating soelectric forces already described as producing rotation and other phenomena.

There cannot be a doubt that the earth is connected up to the sun and planets soelectrically. Magnetic storms on the earth have been noted to synchronise with the appearance of spots on the sun; then again, no display of the aurora borealis takes place without a magnetic storm in the northern hemisphere. Why should the earth and planets keep waltzing round the sun, if they are not connected up in a soelectric circuit.

When the centre of a cyclone passes over a ship it is not unusual to see the compass spinning round without power of direction.

During earthquakes electric phenomena are frequent, such as lightnings, incandescent meteors, flames from the earth, coloured blazes, and fire.

The extent and severity of these phenomena clearly depend upon the number of soelectric bodies in action, and probably also on their individual influence. Saturn and Jupiter, for instance, can endow an earthquake with terrible attributes.

Fortunately, earthquakes send ample warning, and it will not be impossible for experienced experts in the future to say what locality will be visited by an earthquake and the minute of its occurrence.

To illustrate the use of this theory in regard to earthquakes some examples will now be taken. In some cases to save a multiplication of diagrams the Greenwich date of warnings and the positions of the solectric agents only will be given.

At Kingston, Jamaica, January 14th, 1907, occurred a remarkable earthquake. At about half past three in the afternoon a tremendous windstorm accompanied by darkness passed over the town, alarming the inhabitants. This put everyone on the alert, but in a few minutes the first shocks occurred. They were severe shocks and lasted several minutes. Most of the houses fell and fire broke out immediately; which is to be remembered because fires and lights had not been burning.

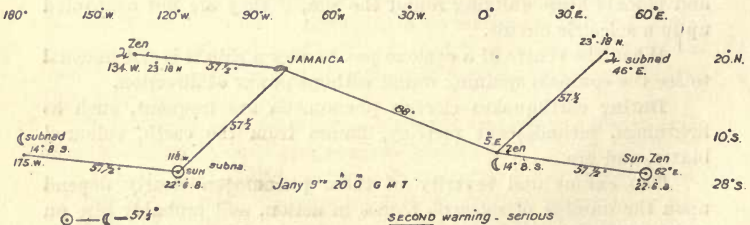
The battery at Port Royal was submerged by a seismic ocean wave, as was Annotta Bay (north side) of island and other places. Two thousand persons lost their lives and £5,000,000 damage was caused. There had been ample solectric warning.

On the 30th December, 1906, the moon was on extreme declination $21^{\circ} 4' 30''$ N. and remained within $1''$ of that position for an hour, the planet Neptune being in near conjunction. About 16 minutes previously the sun and Uranus were $57\frac{1}{2}^{\circ}$ from Jamaica, and now the moon and Neptune were likewise $57\frac{1}{2}^{\circ}$ distant.

On January 13th noon, Greenwich, the moon has again moved to extreme declination S. at $21^{\circ} 4'$ and at that time the sun is 88° from Kingston. These are warnings not to be neglected, and would at once cause a disciple of Solectrics to calculate positions when sun and moon would be $57\frac{1}{2}^{\circ}$ from one another, and see what relation they bore to Jamaica.

The following diagram, Fig. 39, shows that Kingston is in the

JAMAICA EARTHQUAKE. 1907.



The first warning was given on September 23rd 1906, when the Sun crossed the equator in 9° E. (NADIR) - 88° from Kingston

FIG. 39.

greatest danger, and that the danger is indicated on January 9th 20h. 00m., G.M.T., four and a half days before the earthquake actually took place.

But when the sun's combination rushes force to the earth and moon there is raised in the neighbourhood of the ocean, a seismic sea-wave. This "tidal wave" therefore, may accompany a hurricane when no earthquake takes place.

In the case of San Francisco, I have not seen any account in which reference was made to a "tidal wave." This earthquake, however, is serious enough to lead us to expect beforehand some natural warning. If there is no purpose in Nature and her grand works, then all is stupendous foolery; if with all Nature's power, things are left to insane chance and Man with his deep emotions and his heroic struggle against evil is abandoned as the very sport of circumstance, then is Nature but the symbol for Wicked Folly.

But, if it is Nature's design to develop Intelligence in Man and fit him for a grander fate than merely spinning about in space in an infinitude of ignorance; then we can understand that every effect results from some previous definite cause. By that way we can learn Wisdom and save ourselves. If all effects were uncertain and inconsequent, knowledge would be impossible, and intelligence useless. With these thoughts I search in confidence for guidance, and a sign that, although some of man's work may be destroyed, there is a way out for him—who thinketh.

And there in 1906 on April 14th, 5h. 00m., the warning finger marked a danger zone.

At that time the moon was on extreme declination as shown by diagram, Fig. 41, and accompanied by two planets, she cast an arc of $57\frac{1}{2}^{\circ}$ over San Francisco city: the sun at the same time throwing another belt over the land towards Sacramento. The district was thus seriously warned four days beforehand.

Searching further we find that on April 18th, 1h. 21m., G.M.T. the sun and moon were $57\frac{1}{2}^{\circ}$ apart. Moreover the sun with a combination of four planets falls upon the district (a) to north eastward of San Francisco, while the moon, with Jupiter and Mars assisting falls upon the City itself, Fig. 42.

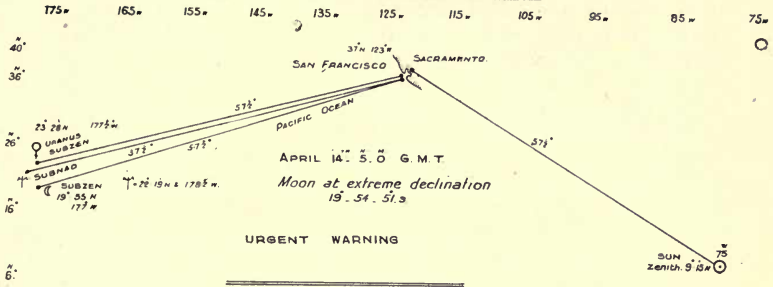
This force rushes violently from west to eastward, lifting the earth's surface into elastic waves of progression; these waves caused the fall of most of the city buildings, and the high potential of solectric force fired everything it passed through.

The solectric position at the time of greatest shock is illustrated by diagram.

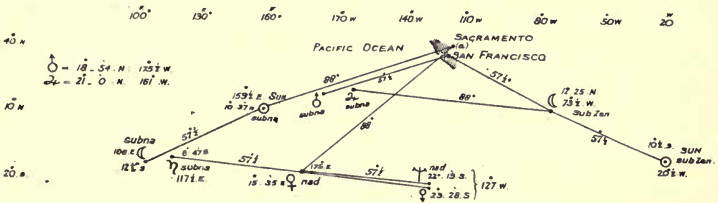
It is said that this was a long earthquake, some observers estimating the duration of serious shocks at over 3 minutes.

This is probable because the sun is enclosed in the circuit of both sides causing an oscillating flow.

SAN FRANCISCO EARTHQUAKE, 1906



Solectric position at the minute of Principal Earthquake.



— 1906. — April 18th 1. 21. Green mean time : local time 5. 13 a.m. 18th

FIGS. 41 & 42.

The above is what solectrics has to say about the San Francisco earthquake, and the remarks are applicable to the other examples.

It may be interesting to know what were and are the explanations of seismic experts in the scientific world, of earthquakes generally.

Mallet considered an earthquake to be an uncompleted effort to establish a volcano.

Professor Milne thought that the depth of origin of earthquakes might be between $1\frac{1}{2}$ and 5 miles ; other observers estimating depths which range from 3 miles to 20 miles. Milne thought these calculated results were of little value.

Causes quoted as authoritative are attraction of sun and moon, fluctuation of temperature and the pressure of the atmosphere.

Milne thought " exogenous phenomena such as these play but a small part in the production of earthquakes, their greatest effect being to cause a slight preponderance in the number of earthquakes during cold months." Milne considered that tremors were due to the

bending or crackling of rocks produced by relief of atmospheric pressure. He also stated some earth pulsations are attributable to earthquakes, while on the other hand certain earthquakes are attributable to earth pulsations.

All this so far is, in the writer's opinion, mere pedantic verbiage; cheap professional humbug which the reader may of course accept, if he finds that it explains anything.

Mr. Davidson in his "Origin of Earthquakes" (1912) printed at Cambridge University Press gives the most recent ideas of science on this subject

PAGE 4. "In classifying non volcanic earthquakes it is convenient to take advantage of differences in the nature of the shock; but in dividing such earthquakes into simple, twin and complex, it will be seen afterwards that, while all result from the growth of the earth's crust, the classification nevertheless corresponds to important differences in their mode of origin."

PAGE 14. Some earthquakes may be connected with the operations of simple folding. It is more probable that they are caused by the abrupt and violent process of faulting. It is the principal object of this volume to show that the great majority of earthquakes are due to the intermittent growth of faults, that, when a displacement occurs at some depth the friction generated by the sudden sliding of one huge rock mass over and against the other must produce an intense jar in the solid crust around, a series of vibrations which propagated outwards in all directions gives rise at the surface to an earthquake shock; and that in those somewhat rare cases in which the displacement is continued right up to the surface, the sudden spring of the displaced crust must complicate and increase the shock due to the grating of the sliding masses. Evidence will be brought forward to show that earthquakes are connected with fractures rather than with crust folding, and with the process of faulting rather than with that of fracturing.

Thus much illumination of the subject from a Doctor of Science and Fellow of the Geological Society. Things are slipping about under us, it appears, and mountains are growing up from the earth.

In regard to the earthquake under discussion Mr. Davison remarks (page 66): "To produce the observed displacements in masses of so great a magnitude, it is clear that the seismic forces must have been for a long time gradually increasing in strength until they reached the point when they were sufficient to overcome all resistance. Before giving way the crust may have begun to yield and bend in the directions in which it afterwards slipped. Then quite suddenly, the

slip took place over a large part of the fault and rapidly extended over the whole of the Northern half of its course. There is little need to seek for any other cause of the earthquake. In the immediate neighbourhood of the fault the sudden spring of the displaced masses would inevitably shatter every building and fissure the surface soil. At a distance from the fault as well as near it, the intense friction generated by such huge masses as they grated past one another would well suffice to produce an earthquake shock of the first magnitude. In the Californian earthquake of 1906, the origin of earthquakes was manifested in an unmistakeable manner. At the same time the scale on which the operations of nature may be carried on was exhibited to a degree hitherto unknown in the annals of science."

I have quoted at length to enable the reader to judge between Solectrics, and the scientific experts, "seismic forces," slips, and faults and fractures." How does Mr. Davison reconcile his statement "The Californian earthquake was in no way remarkable for great strength" with the above passage as to a "degree hitherto unknown in the annals of science": also how does the above passage harmonise with (page 79), "The Assam earthquake of June 1897, takes rank as one of the greatest of which we have any record, and it stands almost if not quite pre-eminent among modern earthquakes."

Learned gentlemen are usually very tedious when they set about explaining what they do not understand.

THE VALPARAISO EARTHQUAKE OF 1906.

On the 2nd of August, 1906, the writer was in Valparaiso Bay in charge of the Pacific Steam Navigation Company's steamer "Oriana," and to him came Captain Middleton a Chilean officer in charge of the Naval Meteorological Office, also an Engineer Officer.

For some years Captain Middleton's predecessor had visited my ship when in harbour to talk over the progress which I was making with the Solectric theory. Captain Middleton being equally interested also came and I was able to explain to him many points which were not clear in my incomplete writings at that time. So that I was not surprised when my visitors stated the object of their visit.

They wished to know if I had calculated any event for August 16th, because from what they could gather by a study of the solectric position on that day they expected a Norther—a storm from the north.

I said there would be a serious earthquake, and possibly a Norther also.

We had several interviews and I strongly pressed my opinion

that an earthquake was threatened, saying also that I was warning the English residents and all friends I knew. I advised Captain Middleton to inform the press and Navy, which he afterwards did. I had intended to write to the press, but my theory had few believers then, and I wished the Chilean Meteorological Office at Valparaiso to have the credit of prediction.

The "Star of Chile" in its issue of August 25th, 1906, says, that Captain Middleton of the Naval Meteorological Department foretold the earthquake in "La Tarde" of the 14th inst. and that Valparaiso was near the centre of danger.

The London "Times Weekly," dated August 24th, 1906, prints the following from their correspondent at Santiago de Chile, August 20th.

"The night of the 16th was rendered dreadful by lightning and pouring of rain, by the snapping of electric cables and wires under the constant strong shocks which occurred all night, and by the booming of the fire bell announcing fires in various quarters. Each shock was followed by the wails and prayers of people kneeling in the rain and mud. The first great shock lasted four minutes and fifty seconds. Such a duration is unknown to memory.

"Bells rang in steeples and pictures swung out from walls owing to the heaving motion. The principal shock was from Valparaiso to Santiago and Melipilla, with its centre at Limache. These two latter towns were completely destroyed as were also Quillota and Llaillai.

"The earthquake was announced by the Naval Observatory at Valparaiso two days before, and the announcement was published in the press the day before. A telegram from Lima says 'No English or Americans have been killed or injured.' " The earthquake took place about 8h. p.m. local time, and caused a loss of life estimated at 10,000 and £20 millions worth of property.

The Authorities were prepared, and Martial law was proclaimed. Says the "Star." The Military command of the town devolved upon Captain Luis Gomez Carreño of the Chilean Navy, and it is principally owing to his prompt action and to the distribution of the troops under his command that Valparaiso owes its immunity from those wretches who use such opportunities for pillage and rapine.

Some hundred and sixty persons caught pillaging were shot in the public squares, besides others at the scene of their robberies. "Before order was assured 680 persons had paid the death penalty" ("Times" 26/11/12).

Captain Gomez Carreño told me afterwards at Newcastle, that owing to my prediction he had troops ready under arms.

Part of the cemeteries fell down the hill into the Plaza Anibal Pinto with appalling results.

Says one witness "a series of rapid electric discharges from the overlaid atmosphere added to the general terror, and it seemed as if balls of fire were descending on the earth.

Another witness says "The Star." "At the first shock I was standing on the Plaza Sotomayor, and the earth's motion was so violent, that I was thrown hither and thither, but horses near me laid down. I saw the sky to the eastward a peculiar steel gray colour, and during those awful four minutes the heavens seemed to open and belch forth balls of electric fire. It is impossible to prove that electricity had anything to do with the result, but within five minutes from the first shock the whole city was in flames at different points." The "Times" of November 26th, 1912, speaking of this earthquake says: "The great city fell like a house of cards on Thursday, August 16th. An eye witness relates that at 5 minutes after 8h. p.m. (query 8.15) it was in ruins and enveloped in a darkness only illuminated by the fires that rapidly broke out, and soon in spite of the drenching rain enveloped the whole circle of the bay in a Gehenna of flame and smoke.

The earth heaved and rocked and shook itself; it was impossible either to stand up or sit down; blue flames like the fire round a plum pudding ascended and descended between earth and sky.

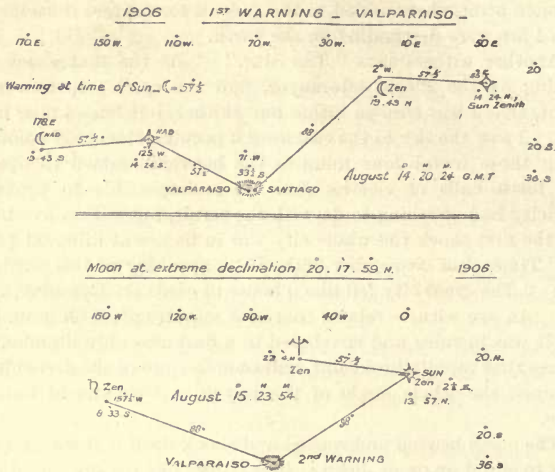
It is important to note that at the first shock the engineers in charge of the City electric power stations switched off all currents so that there were no live wires about.

A friend told me that he was thrown down by the earth's movement on his way home. His spectacles fell off and on his knees he groped for them on the road, which heaved like the sea at intervals. It was very dark with drizzling rain, and coloured flames flashed upwards and along the earth, amid the sound of crashing buildings.

The theory that earthquakes are caused by the earth shrinking and the rupture of internal strata, cannot account for the electric phenomena, the rain and wind storms, the shafts of fire and the meteoric displays.

The accompaniments of many earthquakes such as the rising of the ocean 50 feet, the lightnings and noises in the air; the nervous apprehension and presentiment of coming evil which pervade many persons, and especially animals; people's finger nails turning black, dogs moaning and poultry huddled in a corner; these incidents cannot be explained by one "huge rock mass" sliding over another. They are due to forces which permeate everything and cause the rocks

to slide, if they do slide. Figs 43, 44, and 45 shew the warnings, and the solectric action which caused this great earthquake.



FIGS. 43 & 44.

I have gone into some detail about this Valparaiso earthquake, because by the diagram at the time it took place every planet except Mercury is acting, also sun and moon.

Two planets are nearly on the meridian of Valparaiso and their range is great on that account; also by the earth's rotation the solectric agents are quickly brought into action.

The solectric forces are very powerful and if one may say so, in terrible disorder, positive and negative flashing upwards and downwards seeking to establish equilibrium.

The Santiago Observatories were offended and they brought about a persecution of Middleton, crying out to him, as it were, "Prophecy unto us." They gave him a list of dates of earthquakes, including some false dates, and bade him calculate where these earthquakes took place, and which dates were false.

Only an expert after long practice could do this successfully and I am greatly grieved to hear that Captain Middleton took the bitter criticisms to heart, and died.

In July, 1912, I sent to Chile a series of predictions of weather for

September. These proved to be perfectly correct, and being based on astronomical data were no doubt highly distasteful to the Director of the Astronomical Observatory at Santiago, Señor F. Ristenpart. Likewise there was a prediction of seismic disturbance on September 29th-30th; accordingly at that time 17 temblores actually occurred in the vicinity, also at Juan Fernandez; torrential rain and a volcano breaking into activity were other items of interest. This would be gall and bitterness to Señor Montessus de Ballore, Chief of the Seismological office of Chile, whose language and that of his colleague became personal and abusive towards me. They suggested in public newspapers that I was insane. Before the above events happened and at the instance, no doubt, of the the non-intelligent section of authority, the President of Chile cabled to the Foreign Office in London, and I was twice hunted up by police—so that I might use means to turn off the predicted earthquake!

The story is too long for a scientific book, and as the smile is now on the face of the delinquent, we may pass on; but without any thanks to a single observatory. My absence of regard includes the learned gentlemen in charge of San Francisco, Santiago and Mexico observatories. Greenwich Observatory has a great dislike of any meteorological theory, with the moon in it. Some did spitefully use me, and I pray not for them. Absolute ignorance of the causes of earthquakes is the charge I bring against our present scientists. And I would now that they change their attitude to a benevolent tolerance of new ideas; for as our Bard hath it. "Ignorance is the curse of God" (Henry VI).

Macao and Hong Kong would not reply to my queries seeking typhoon information. Japan has been most considerate, and so has Australia.

The only English "learned bodies" that have not been actually obstructive to my work have been the Bidston Observatory (Mr. Plummer), and the Admiralty Hydrographic Department.

I mention these things in regard to the pernicious majority as a reward for their perverse obstruction, not that their learned opinion is of any value on these subjects.

In 1912, the Director Senor De Montessus de Ballore wrote to "El Mercurio" of Valparaiso a letter finishing as follows:—

"As for me I shall be very calm on the 18th and 30th of September thinking that only God knows whether an earthquake threatens us or not, and I declare myself to be totally ignorant in this regard. Even should Captain Cooper's prophecy come to pass I would not believe in his theory. (It did come to pass).

"I am in good company—the company of all seismologists. To

what purpose, then do our seismological observations serve? To prepare for our successors. It may be that after some centuries they will *judiciously* foretell earthquakes."

Evidently De Ballore forgot that in his very same letter is the following paragraph.

"No puede negarse que el capitan Middleton utilizo la teoria del capitan Cooper para pronosticar que un temporal o un terremoto (notese la doble solucion del problema), amenazaba la ciudad de Valparaiso el dia 16 de Agosto de 1906. Ha sido buen profeta y se comprende muy bien que el publico se alarme actualmente al leer la carta del marino ingles, etc.

Santiago, 30th August, 1912.

Translation.—"It cannot be denied that Captain Middleton made use of Captain Cooper's theory to prognosticate that a storm or an earthquake (note the double solution of the problem) threatened the City of Valparaiso, on the 16th of August, 1906. He has been a true prophet and it can be easily understood that the public is now alarmed by reading the letter from the English seaman, etc.

Santiago, 30th of August, 1912.

DE MONTESSUS DE BALLORE."

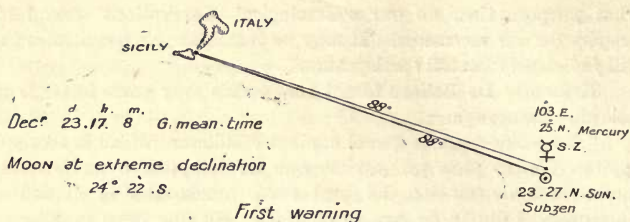
THE MESSINA EARTHQUAKE OF 1908.

This earthquake was one of the most disastrous on record. The ruined cities of Calabria and Sicily were very populous, and the buildings high, added to which the time of occurrence, 5 hours 30 minutes on a December morning, found most of the inhabitants asleep or indoors. A seismic sea wave 30 feet high followed the earthquake, and swept the quays and lower streets of the cities. It is computed that 300,000 people were killed in a few minutes, and that property of the value of 150 millions of pounds was lost.

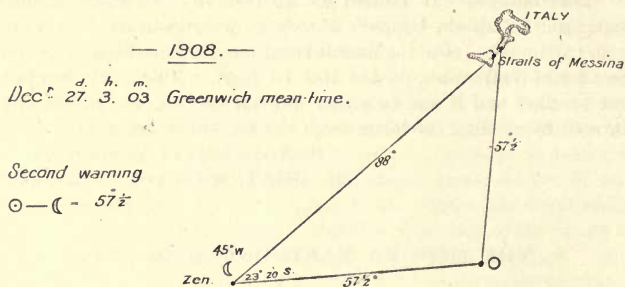
Survivors stated that thunderous noises were heard just before the earthquake, and vivid lightning flashed.

More violent shocks have been felt in other parts of the world, but in Messina, and other destroyed towns, houses were built on the sides of mountains, so that any serious earth movement caused landslides, and the upper houses to fall and wreck the lower ones. That and the sea wave caused the great loss of life.

The first warning was written in the heavens on December 23rd, five days beforehand. The second warning confirmed this when the moon and sun were $57\frac{1}{2}^{\circ}$ apart, and the threatened place seemed to be at the entrance to Messina Straits.



MESSINA earthquakes. Two warnings.



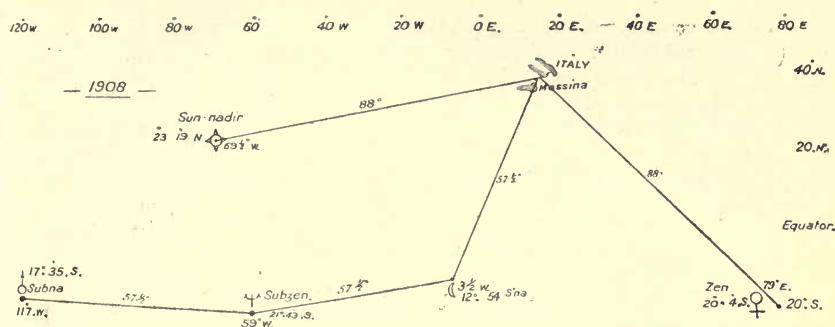
FIGS. 46 & 47.

The first shocks came at about 5h. 22m. a.m., when the combinations were acting on the sea to the eastward.

Then the sun's combination struck the Calabrian coast about 5h. 26m. a.m., and the moon's combination struck the Sicilian coast about 5h. 35m. a.m. The Messageries mail steamer "Euphrate" reported that "5.35 a.m., December 28th, after passing Messina the vessel was violently shaken, and the light of Messina lighthouse became no longer visible. The solectric forces seem to have flowed across the Straits at high potential from Calabria to Sicily—sun to moon.

In the course of the reparation of the submarine telegraph cables in the Straits of Messina, says a daily paper of April 3rd, 1909, it was found that the cables were burnt in places. It would be difficult to harmonise the crumpling and crinkling earth crust theory with this proof of fire effects on the bed of the sea.

Messina City occupies the type of a situation required by the



Position of solelectric elements on December 27. 16.39 G. mean time.

Local time 5.39 a.m. Dec. 28. Shocks began when combinations were a little Eastward.

MESSINA and CALABRIAN earthquake, followed by a seismic sea wave of 30 feet.

FIG. 48.

Solelectric theory as illustrating a dangerous earthquake country. There are the mountain peaks overhead, ready conductors of large volumes of Solelectric force and on both sides of the Straits are heavy mountain masses with points to gather and concentrate Solelectric forces, or to suddenly dissipate them; then the Straits converge to a narrow exit at the north end, with some low-lying land ready to be submerged by the seismic sea wave whose progress it obstructs.

When explaining the Solelectric theory, it was stated that the Solelectric bodies are not mathematical points, positions without magnitude; consequently the moon does not pass the equator in a moment, nor does the sun's influence at 57° or 88° extend only over a mathematical line or arc. A planet may be allowed a margin over a close calculation of one degree, the moon of two degrees, and the sun of two degrees.

This is probably an explanation of the fact that earthquakes do not act altogether as explosions, but generally as a series of shocks, extending over some time. The first shocks would occur as soon as the Solelectric contacts were just barely made—then with a distinct contact, though at an outer margin, the great shock would happen, because at that time there would be the greatest pressure or potential of Solelectric energy straining for release.

The moment a solelectric path was distinctly opened to the sun the

crash would come, and the pent forces would be gathered up from the earth and re-distributed among the planets.

We often hear of records made by seismographs of quite serious earthquakes, and never receive any confirmatory news of them. This is sometimes the case, because the earthquake has happened in a desert country or wilderness not in touch with civilisation.

A case occurred at 8 h. 52 m. a.m., January 22nd, 1910, when it appears that European seismographs recorded an earthquake of violence and extent greater than Messina or any for five years. Beyond a few minor shocks, this "vast earthquake" was not confirmed by further news. A Solectric calculation placed the disturbance near Timbuktu, in the Western Soudan, Africa, whence it would be unlikely that any news would come.

Many of the notices, however, recorded by seismograph and not confirmed may relate to Solectric phenomena taking place in some neighbouring planet.

Professor Milne, F.R.S., in a letter to the press explaining the Messina earthquake said that the land of Italy was growing upward and had been since Roman times. It was also sinking as proved by the temple of Jupiter Serapis, which had sunk 20 feet below ocean level since the temple was built. The earth is shrinking, and crumpling like a concertina when it is closed, a ridge going up and a parallel depression going down. "Science to-day," concludes the Professor — "can explain much, but humanity is just as helpless as when it trembled before a visitation such as this, as before the wrath of God."

Evidently there is small comfort in the theories of the learned experts who affect to speak with authority; they append letters after their names to vouch for wisdom, and cover their ignorance with a multitude of words. Mr. Milne's letter is too long to quote, being 720 words.

The Solectric theory holds out the hope that if half as much time and money were spent on it as the Meteorological Society uses to record the height of the barometer, we should avoid being killed by earthquake, colliery explosions and such like natural causes, because they forewarn us.

From youth onwards it is pumped into one's empty head that the earth is cooling, cooling and crinkling—until—one begins not to believe it.

The temperature of space is put down at minus 273° C. and this planet for millions and millions of years is supposed to have given off its heat all that time and is doing so still.

I have been on summits of the Andes, but observed no heat waves going off into space, in fact I was never colder in my life. The

aviator and balloonist have the same tale to tell. Then where does all this heat go to.

Fires, and factories and smelting works assist the earth to cool by consuming millions of tons of the planet. Still the earth remains no colder than when our first histories were written. Sometimes we ask, where are the old fashioned frosty winters.

A man burns a heap of garden stuff; he sees flame, feels heat, then the remainder is just earth again. The flame is the means by which Nature turns all the gases into their residual condition, Solectric force, which eventually reaches the sun again.

When the earth accumulates an over-pressure of Solectric force, the interior is heated, mechanical work is done by lifting the earth or sea in waves and by erupting at the volcanic vents.

But the earth simply sends back the overcharge to the sun, sometimes in a violent mood—which overcharges often produce.

THE GREAT INDIAN EARTHQUAKE OF 1905.

This earthquake occurred on the 4th April at about 6 h. 15 m. a.m. local time. It appears that for violence and the area covered it is one of the greatest of which there is any record. Unlike the Messina earthquake the country affected did not contain large populous towns, yet 20,000 people lost their lives.

The hill station of Dharmsala, about 100 miles N.W. of Simla was overwhelmed and may be reckoned as near the centre of disturbance—Latitude $32^{\circ}-20'$ N. and $76^{\circ}-15'$ E.

Dr. C. Davison writing to the "Times" says—"The origin of the earthquake is no doubt to be sought in one of the great movements to which the formation of these still growing mountains (the Himalayas) is due.

Now this enables the Solectric theory to come to grips with all scientific geologists. Their best man can only say "the mountains have moved and are still moving." There are huge cavities in the interior it is also asserted into which the strata fall with horrible sound and shock; the earth shrinks but the mountains grow.

Very well, learned gentlemen may have it both ways. Below is a letter from Dr. Davison in full as it well describes the character of this earthquake.

THE INDIAN EARTHQUAKE, 1905.

TO THE EDITOR OF THE "TIMES."

SIR,—The details that we have so far received about this great earthquake, imperfect as they are, enable us to form some conception

of the strength of the shock and of the vastness of the area disturbed by it. The region within which serious damage to buildings occurred is about 520 miles in length ; and if, as is very probable, Dharmasala be near the centre, its width cannot be less than 360 miles, so that the total area of destruction must be about 150,000 square miles—that is, about three times the area of England, and considerably more than the area of the United Kingdom. The boundary of the region in question is roughly oval and elongated in the direction of the Himalayan axes, so that the origin of the earthquake is no doubt to be sought in one of the great movements to which the formation of these still growing mountains is due.

If we may measure roughly the strength of an earthquake by the extent of the area disturbed by it, it would seem that one of the first places among all recorded earthquakes must be assigned to the recent shock. The great Indian earthquake of 1897, it is estimated, was felt over an area of $1\frac{3}{4}$ millions of square miles ; but, if it be true, as reported, that the shock of April 4th was felt at Bombay and Calcutta, which are about 980 and 1,020 miles from Dharmasala, then the area over which it was perceptible would be about twice as large, and therefore not much less than the area of all Europe.

There was, however, no part of the earth's surface at which the earth-waves were insensible to seismographs. An exceedingly detailed record of the disturbance was given by a horizontal pendulum at Birmingham. The first tremors were registered at 1 h. 6 m. 18 s. a.m., and were succeeded at 1 h. 29 m. 2 s. by long-period undulations lasting for more than an hour and a half. The more prominent of these undulations are in two series, separated by a few minutes and it is remarkable that a little more than two hours later the diagram shows another double group of waves. The early tremors took a direct course through the body of the earth ; the first double series travelled along the surface by the shortest way to Birmingham ; while the second double series followed the longest possible route, through the antipodes, and back again to Birmingham. About $3\frac{1}{4}$ hours after the first movement they must have completed their journey round the earth and returned to the centre of disturbance.

Yours obediently,

CHARLES DAVISON, Sc.D., F.G.S.,

16, MANOR ROAD,

BIRMINGHAM,

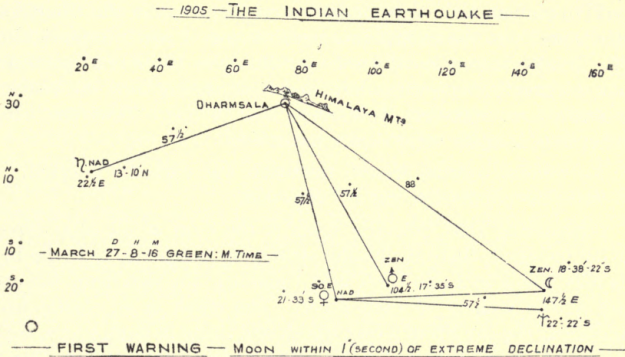
April 12th, 1905.

As to whether the earth is hollow in places or that mountains are growing, the Solcetric theory does not undertake to decide.

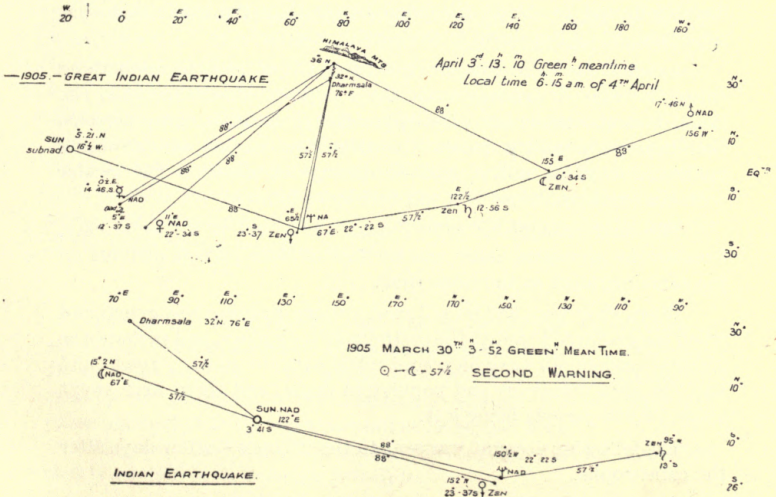
Solectric energy, however, may be matter in another form, and matter may be resolvable into energy, as we see every day in the combustion of coal and production of electricity.

The earth itself could grow and be fed on Solectric force, a statement which may be open to argument.

But it is not open to argument, for it is a fact, that the Solectric theory predicts this Indian earthquake by means of a first warning seven days five hours before the event.



A second warning four days ten hours beforehand marks the spot at first indicated.



FIGS 49, 50 & 51.

The diagrams will show that the hour of earthquake and its position might have been definitely calculated long beforehand ; just as the writer now calculates it 11 years after date.

Moreover, its serious character is also evident because all seven planets together with sun and moon take part with the earth in the general interchange and balancing of the total amount of the Solectric force.

Five planets make a combination with the sun in the Dharmasala district, and here the tremendous accumulation of power is passed into earth, it also rushes northwards towards the Himalaya mountains shaking a great extent of country, and then passing from the Peaks to the moon's combination of Mercury and Venus. Thus the whole solar system is again solectrically balanced.

No wonder a great area of the earth was violently affected. It was well that population was not crowded.

Considering that Solectric force is the sum of all solar forces, gravity included, there is nothing strange in imagining that the high hills may dance at a sign from their Creator ; the sign being the attitudes of the planets to each other. The earth is an elastic body vibrating at the rumble of a cart wheel, and rising in large waves as the force which gives life to her rushes from a higher potential to a lower, along the undulating surface.

Such a theory goes far to explain happenings like those under discussion, and to satisfy the mind better than the crude idea that something has fallen down in the earth's interior.

I cannot say something has not fallen ; but does that something cause the wicked weather usual at earthquake time, the rains, the liquid fires of various hues, the apprehensive dread of many persons, the dogs premonitory moan, the trembling horses and cowering poultry, the weird noises, and whisperings of ghosts. The reader with the evidence before him will decide for himself.

The next example is from Japan, 1896, and is a special case, because the prevailing cause was the fact of three planets arriving on the same meridian at the same time.

When they were 88° from Japan a sharp warning was given, and when they were $57\frac{1}{2}^{\circ}$ away, the earthquake took place, and perhaps the greatest seismic sea wave on record rolled over the coast. Towns and hamlets were numerous and population dense, and these were swept away, 30,000 persons being lost.

The following account was sent to the " Times " a few days after the catastrophe.

THE GREAT SEA WAVE IN JAPAN, 1896.

A letter from Yokohama, dated June 20, says :—

Latest official returns show that the mortality resulting from the great sea wave that swept a large portion of the north-east coast of Japan on the night of June 15 is very much greater than was at first supposed. The collection of information after such a disaster, which has practically blotted out several thriving towns and many small hamlets, is necessarily attended by many difficulties, so that it is not surprising if the first reports sent out were far wide of the mark. The Governors of the Prefectures affected have prepared lists which show a death-roll of over 30,000. It seems clear that the wave originated at a short distance from the Japan coast. Some displacement of the ocean bed about the southern edge of the great Tuscarora Deep probably caused a disturbance, the western section of which, in the form of a sea wave, 80 feet in height at some points, impinged upon an extent of coast line some 300 miles from the south-west to north-east. The enormous loss of life is largely accounted for by the fact that the visitation occurred at night. The Japanese, especially in the country districts, retire early to rest and are awake with the first blush of dawn, performing indeed, the greater part of their daily task before noon. When, therefore, the sea rose at 8 p.m. on the 15th inst., it found most people asleep. There was little, if any, warning of the coming disaster. True, some observers report that it was preceded by tremors, and at other points slight earthquake shocks are said to have been felt. But for the most part the sea found easy victims and few escaped to describe the horrors of the scene. There is, however, less suffering, so-called, than might be expected to result from a disaster of such magnitude. Whole families have been removed, and few survive to profit by the charity which has already been called forth by the awful character of the calamity. Rice is, however, being sent forward to the devastated regions, the survivors in some cases being reduced to such straits that they eat in a raw state the fish left in the fields by the receding waters.

The letter is interesting, and the origin of the earthquake is attributed to a displacement of the sea bed at the bottom of Tuscarora Deep, 4,655 fathoms. One would have preferred a more convenient locality for purposes of investigation; though I think with the correspondent that the sea wave might be 80 feet high.

The two diagrams illustrating this event will be found to clearly explain it on Solectric principles.

canals, this plain has been converted into one of the chief rice producing districts of Japan, the largest towns in it being Nagoya, Gifu and Ogaki. The whole of it is however thickly populated, the road from Nagoya to Gifu twenty miles in length, traversing a continual succession of villages.

"The most strongly shaken area includes all this plain and the mountainous district to the north, and contains about 4,300 square miles (page 68).

"Within this area, nearly every structure raised by man was thrown to the ground or destroyed.

"The great fault was about 70 miles in length."

Now I contend it was not the earth's fault that all this destruction took place; it was caused by the united action of all Solectric elements. This earthquake is splendid evidence of the truth of the Solectric theory. All the planets and the sun and moon are concentrated on the main island of Japan. Consequently the earth heaves in waves and splits at places where the crust is not elastic, nor can there be surprise at the enormous destruction. Also be it noted that at least two warnings were sent, the first one five days beforehand by our neighbour the moon.

Dr. Davison says (page 94) "Occasionally a great earthquake occurs without the slightest warning of its coming. "Before the Californian earthquake of 1906 and the Messina earthquake of 1908, no slight shocks appear to have been observed."

On the contrary, this chapter of Solectrics proves and declares with emphasis, that when Nature intends to strike, the menacing hand can be seen figured in the heavens. Those who look upward, and not into the bowels of the earth, where darkness is, they can read the warnings, and they alone feel that man's intelligence though infinitely smaller, is of the same quality as the intelligence behind all things.

It is said, "The earth is the Lord's and the fulness thereof," but it is given on to man to manage for his own good. We know enough even now in our days to abolish evil, if we unite with one accord to do so. There is none to say us, Nay; if we will, there is a way.

Our first 20 years of life should be given to development, education, and learning to produce something. The next 40 must be passed in compulsory and regular work at some useful production, of benefit to the general community. The rest of life must then be guaranteed by the community free of anxiety for food, shelter and clothing, and means supplied for travel in reason.

How absurd for man to own the whole surface of the globe, the sea and all that is in it, and yet always be squabbling, and fighting

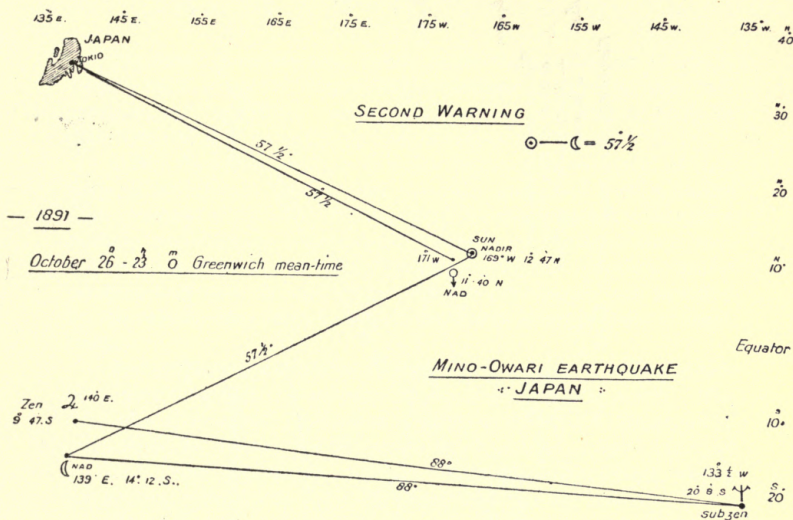


FIG 55

and robbing one another, for more, more.

Man has fairly well made an inferno of this earth striving for riches which must soon be left. Now that we know how to produce, and never need fear starvation so far as the earth's produce is concerned, it is time we decided for a new life devoted to industry and general happiness.

Nature's reward of idleness is weeds and degeneration.

But this is a digression, so we turn to a chapter on volcanoes.

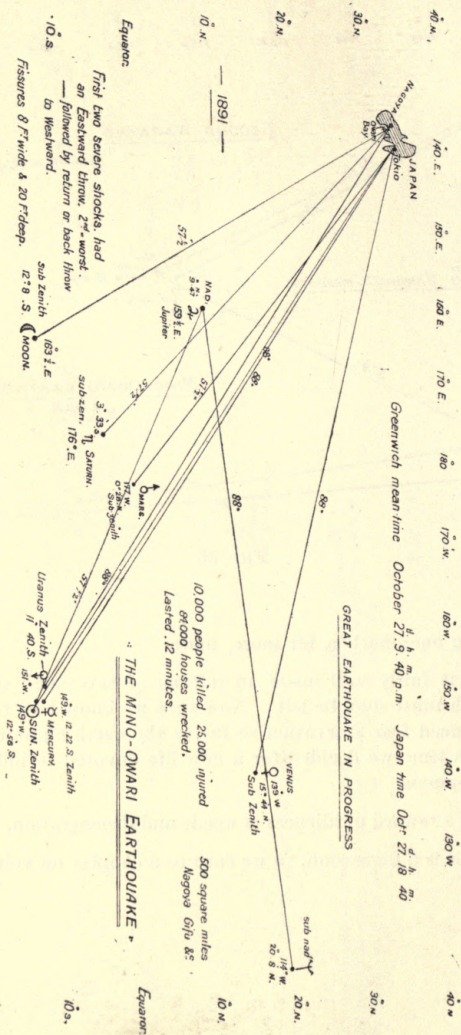


FIG. 56.

"From its effects on bridges & engineering work, the earth movement was as violent & extreme as that of any earthquake in history" - Times 1891.

Volcanoes.

The same Solectric rules which guide the calculation of earthquakes hold good for volcanoes. Volcanoes require greater preparation, and for months various combinations pass over or linger in their vicinity, as if to re-charge their dormant batteries.

When the sun's centre is near the Equator or within 5' of it, a circle of influence is thrown over volcanic country of such a nature that a volcano will break out into active flaming eruption whenever a suitable combination, a detonating mixture, next passes that way. Between the time of sun's first intimation and the eruption various combinations assist to conduct matters to a climax, and may be noted by the volcano answering with a shake, horrid noises or puffs of black smoke.

To fully describe all these events and times would overburden this book with diagrams and become tedious from wealth of detail. The examples given are to illustrate a complex subject, and though much more could be written, the author does not pretend to have garnered all the volcanic secrets yet, many of which are hidden deeply among the glowing furnaces in which this planet reforms the rocks.

We have yet to analyse the peculiarities of planetary Solectric forces and discover why one planet induces rain and another drought ; why one should so often preside at seismic dances and another at volcanic orgies.

The earth's volcanoes are probably situated over good conducting material which leads the Solectric force down to regions stored with fiery oils and gases ; indeed we shall see by our next chapter that Solectric force permeates through solids and extracts their enclosed gases by heat and pressure.

Given, therefore, that sufficient potential is developed by any combination passing over a volcanic district, its path will be illuminated by flames from the mountain tops.

A prepared volcano will flash into eruption almost on the instant that the detonating rays from the sun strike the mountain peak. There is a similarity between the explosions of a volcano and those sad events which wreck coal mines.

It will be necessary for countries situated in known volcanic areas to institute a school of experts, so that all combinations affecting their district may be noted, and precautions taken.

The same may be said in regard to earthquakes and storms.

Our calculations up to the present have been facilitated because the place of the occurrence, and in some cases the time also, have been

known. When both these elements have to be computed, as is necessary for successful prediction, it is obvious that expert calculation and experience will be required.

The examples of volcanic eruption given will serve to demonstrate the connection between Solectric force and volcanic activity.

On March 20th, 1883, 10 h. 50 m. p.m. Greenwich, the sun was passing the Equator in longitude $17\frac{1}{2}^{\circ}$ E. nadir. The radius 88° from the sun passes over Krakatoa volcano. While the sun is still on the Equator (at 11 h. 13 m.), the moon is at 7° S. and 163° E. nadir, which position is $57\frac{1}{2}^{\circ}$ from Krakatoa volcano.

This is the first intimation that Solectric force is accumulating there, and that a serious eruption is in preparation: it took place three months afterwards.

In 1906, there was a violent eruption of Vesuvius during the early part of April. The sun was crossing the Equator on March 21st at 1 h. 6 m. p.m. Greenwich, and the moon's position was $14^{\circ} 45'$ S. and 52° W. A distance of 88° from that position, taken as a radius curves over Vesuvius.

The sun's circumference is still on the Equator at 1 h. 36 m. p.m. of March 21st, and a radius of $57\frac{1}{2}^{\circ}$ from sun's position in 24° W. reaches over Vesuvius.

This is the first intimation of the dreadful eruption which took place a fortnight afterwards.

In November, 1909, the Peak of Teneriffe broke out into eruption after a century of quiet inactivity.

When the sun crossed the Equator on the 23rd September previous, it was $57\frac{1}{2}^{\circ}$ from Teneriffe; and the planet Mars, in $4^{\circ} 10'$ N. and 68° W., was also distant $57\frac{1}{2}^{\circ}$ from Teneriffe.

On same day, an hour-and-half before that (3 h. 10 m. p.m.) the moon was at extreme declination $25^{\circ} 35'$ S. and 52° E., the distance from Teneriffe being 88° .

In 1892, June 7th there happened a great eruption of the volcano of Sangir Island.

Sangir Island is situated in 4° N. and 126° E., S. of the Phillippine Islands. "A remarkable feature of the eruption was its suddenness. Un-announced by earthquake, subterranean rumblings, or torrential rains, a terrific eruption began at 10 minutes past 6 hours in the evening. Immense masses of ashes and large stones killed hundreds in the fields, and villages were swept away by rivers of molten rock." (Reuter).

Although so sudden and unexpected, the eruption gave a Solectric warning eleven weeks before.

On March 19th, 15 h. 36 m. G.M.T., the sun was crossing the

Equator and was in longitude 126° E., that is, on the Solectric meridian of the Sangir Island volcano. At the same minute the planet Saturn was in $3^{\circ} 40'$ S. and 126° E. longitude nadir. Jupiter in $0^{\circ} 42'$ S. was also within seven minutes of conjunction with the sun. Both planets were, therefore, acting on the longitude of Sangir Island.

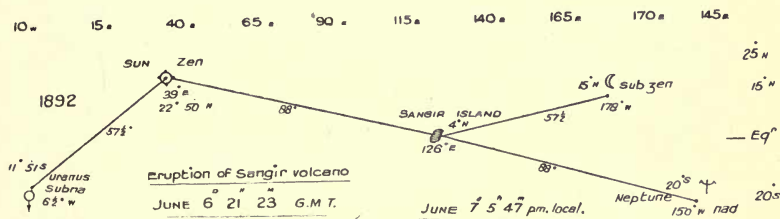
At the same minute, Mars in $23^{\circ} 35'$ S. and 42° E. is in touch with the sun at 88° distance, and Sangir volcano.

This combination is an urgent first intimation that Solectric force is accumulating in 126° E. longitude.

During the eclipse of the sun on April 26th, the sun was 88° from Sangir Island; and on April 30th, when the moon was at extreme declination, it was also 88° from Sangir volcano and $57\frac{1}{2}^{\circ}$ from the sun.

These are but a few causes. At the time of what may be called firing the charge, or starting the eruption, the diagram shows the positions:—

— FIG 57 —



One of the greatest volcanic eruptions on record was that of Krakatoa, Sunda Straits, in 1883.

After the intimation of March already referred to, there were six Solectric combinations acting on Krakatoa up to May 20th, 1883.

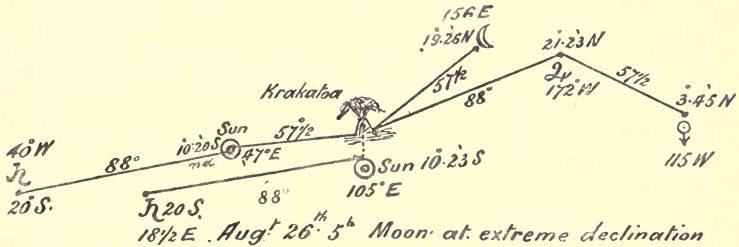
- | | |
|--|---|
| δ_1 \odot April 5th, 7h. 17m.
Moon on Equator. | \odot conjunction δ_2 April 11th, 18h.
$21^{\circ} 30'$ N.. 156° E. |
| \odot_3 April 13th, 16h. 58m. \odot to $\odot = 88^{\circ}$
\odot_3 Sun on Solectric Meridian, 105° E. | |
| \odot_4 April 25th { 23h. 10m. Moon extreme declination.
TO
23h. 30m. $19^{\circ} 46'$ N. | |
| \odot_5 May 2nd, 7h. 7m. $\odot = 2^{\circ}$ N.
\odot_5 in $15^{\circ} 27'$ S. | \odot_6 May 10th, 17h. \odot Solectric Mer.
$\odot_6 = 17^{\circ} 30'$ N. 57° after \odot 's eclipse. |

This was followed by vapour columns, explosions, and flashes of lightning.

After a rapid decline in violence at the end of May, an increased eruption began on June 19th, and a second crater was formed on June 24th. On the 19th June the moon was at extreme declination at 13 h. G.M.T., and while at this position, $19^{\circ} 48' S.$, the sun was $57\frac{1}{2}^{\circ}$ from Krakatoa; the moon nadir was $57\frac{1}{2}^{\circ}$ from Krakatoa, ($19^{\circ} 48' N.$ $157^{\circ} E.$); and Venus and Saturn were $57\frac{1}{2}^{\circ}$ from Krakatoa, while the moon was within a few seconds of her extreme declination.

Through July and August intermittent eruptions continued when a Solelectric combination fell over the volcano; and especially if the sun happened to be in the longitude of Krakatoa, when the moon was at extreme declination.

The report continues, and it appears there was a gradually increasing eruption on August 23rd. On Sunday, August 26th, the explosions were heard 150 miles off, but no earthquake shocks. An immense wall of cloud was observed with bursts of forked lightning like large serpents, rushing through the air. Balls of fire rested on ship's mastheads and extremities of yardarms.



Upper lines refer to August 26th, 8h. 53 m. G.M.T.

FIG. 60.

The height of the eruption was on the night of the 26th and morning of 27th.

On the 27th a storm raged, and there was great darkness over a radius of 150 miles. A series of tremendous explosions occurred between 5 h. 30 m. a.m. and 10 h. 52 m. a.m.

These explosions blew away the northern portion of the island, which had been from 300 to 1,400 feet high. For 1,000 feet below sea level the island was carried away, and the sea rushed into the hollow. This caused frightful waves, estimated at 150 feet high,

which submerged all the coast towns. The people known to be killed numbered 36,380.

As there was little earthquake it is evident that the waves which submerged the towns and careered round the world were caused by the sea flowing into the volcano's crater, and being frequently ejected with prodigious violence until the crater was again sealed up.

The Solectric force accumulated during August, and culminated on night of 26th and morning of 27th, when the great explosions occurred through the agency of sun and moon, assisted by Saturn and the greatest planet Jupiter.

MONT PELEE. Martinique, 1892.

To set out in detail and discuss the various Solectric causes which contribute to the making and carrying on of a first-class volcanic eruption would require a separate volume. Any investigation, however, must include a reference to the eruption of Mont Peleé, Martinique, which took place on May 8th, 1902.

Private letters received in France, written just before the catastrophe of St. Pierre spoke of two months' drought, and of the extreme heat. This is interesting in view of the Solectric preparation so much insisted upon in this work.

Mlle. Martin, one of the victims, writing to relatives at Marseilles on May 2nd says: "yesterday we had three shocks of earthquake, occasioned by this terrible neighbour Mont Pelee."

The volcano began to smoke on May 2nd, and was actively erupting on May 3rd. On the 5th May boiling mud, stones, and fire poured out and destroyed the Guerin sugar factory, with the loss of 300 lives.

On May 6th all cable communication was broken, and on the 7th there were frightful explosions with showers of red hot stones.

A report from St. Lucia to the "Times" said: "On the afternoon of May 8th the steamer "Roddam" crawled slowly into Castries Harbour.

She was quite unrecognisable, being grey with ashes, while her rigging was dismantled and her sails and awnings were hanging torn and charred.

The captain reported that he had just anchored off St. Pierre at 8 o'clock in the morning in fine weather, following upon an awful thunderstorm in the night, and was talking to the ship's agent, who was in a boat alongside, when he saw a tremendous cloud of smoke glowing with live cinders rushing with terrific rapidity over the town and port.

The town in an instant was completely enveloped in a sheet of flame from which fire rained on board the steamer.

Twelve of the "Roddam's" men were lying dead, burned out of human resemblance among the black cinders which covered the deck.

Another survivor stated that there was a roar and an explosion caused by the ejection of a vast body of volcanic gases blazing with intense heat, which poisoned or burned everything in its path.

The whirlwind of fire was three minutes in sweeping down the mountain over the city, and across the roadstead, and in that time everything was aflame, and the sea foaming like a boiling cauldron. Nineteen ships were overwhelmed and burnt.

The ruins blazed for three hours, and then no sound was heard save the roar of the volcano, the crash of falling stones, and the ceaseless onrush of ashes, fire, and steam.

There is some discrepancy about the correct mean time of the outburst, because many of the St. Pierre clocks stopped at 9 m. to 8 h. a.m. on the 8th May. But the captain of the Roddam said he had anchored off St. Pierre at 8 h. a.m. and was talking to the agent at the time of the occurrence. As navigators are compelled to be accurate in regard to time, and the Roddam's clock would be set with Greenwich as a standard, apparently the time of this eruption was a few minutes after 8 h. a.m. mean time at place, reckoned from Greenwich.

While the position of the sun is of great importance in any calculation of volcanic phenomena, the sun cannot be treated as a mere point without magnitude. The active influence seems to be confined to a belt having a width of quite 5° to 6° , due to the sun's size.

A few of the preparatory Solectric combinations are noted.

On March 16th, 4 h. 4 m., moon being on extreme declination, is also 88° from Martinique.

On March 16th, 4 h. 4 m., sun is on longitude of Martinique, its Solectric meridian.

On March 22nd, 19 h., moon, when crossing Equator in 116° W., was $57\frac{1}{2}^{\circ}$ from Martinique.

On March 30th, 4 h. 4 m., moon on extreme declination.

On March 30th, 4 h. 4 m., sun is on longitude of Martinique, with Mars in conjunction.

April 6th, 6 h. 12 m., moon crosses the Equator in 116° W. at a distance of $57\frac{1}{2}^{\circ}$ from Martinique, and Jupiter is 88° from Martinique.

April 8th, 0 h. 12 m., the sun in 3° W., the moon and Mars in 4° W., are $57\frac{1}{2}^{\circ}$ from Pelee; sun near its eclipse.

April 12th, 9 h. 56 m., moon on extreme declination N.

April 12th, 9 h. 56 m., sun $8^{\circ} 36' N.$ $149^{\circ} W.$ plus 88° to Martinique.

April 26th, 11 h., moon is in extreme declination S. moon's nadir position plus $57\frac{1}{2}^{\circ} =$ Martinique; Jupiter is on Solectric meridian.

On May 1st, 4 h. 5 m., the sun was in $14^{\circ} 55' N.$ and $61^{\circ} 15' W.$ vertically over Mont Pelee, and Mlle. Martin reports that they had "three shocks of earthquake occasioned by this terrible neighbour."

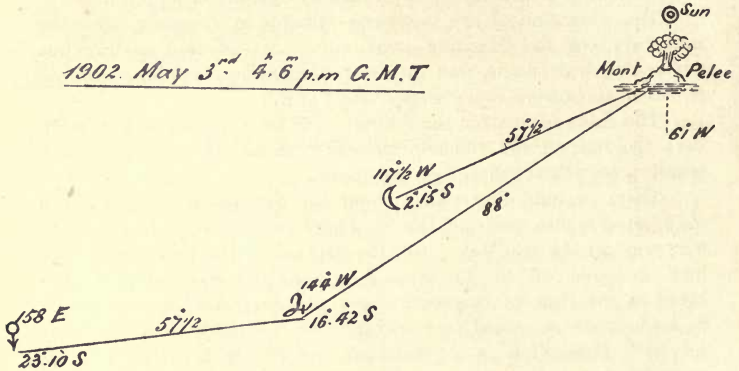


FIG. 61.

"The eruption actually began on May 3rd."—Telegram to Colonial Office.

The sun and moon at 57° , along with Jupiter, form a strong Solectric combination.

"Boiling mud and fire poured out, and the Guerin sugar factory was destroyed, with 300 lives on the 5th May."

Since the last diagram for the 3rd, the moon has on the 5th, 4 h., moved to the eastward, and in place of being $57\frac{1}{2}^{\circ}$ from the sun and Mont Pelee, is now $57\frac{1}{2}^{\circ}$ from Jupiter. Sun is in $16^{\circ} N.$, but covers the Solectric meridian of Pelee.

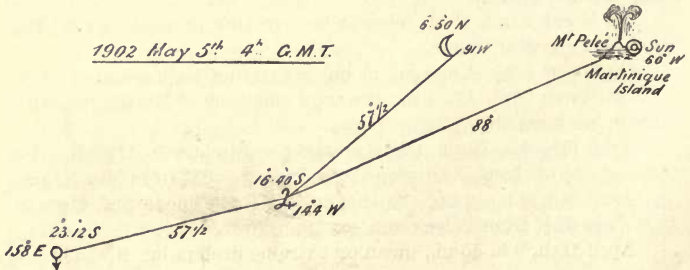


FIG. 62

On May 7th "there were frightful explosions and a shower of red hot stones."

On May 7th, there was also an eclipse of the sun, and the next diagram shows the Soletric position at that time.

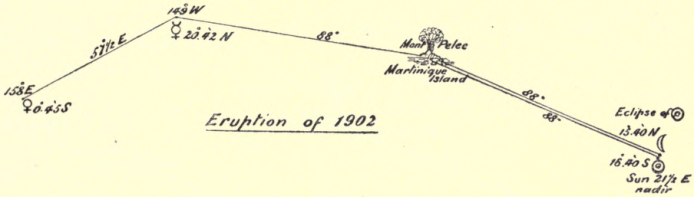


FIG. 63.

During the night of May 7th the "Roddam" was steaming southward from St. Thomas to Martinique, and the captain reported that he had passed through an awful thunderstorm, but arrived off St. Pierre in fine weather. The morning was fine, and apparently the volcano had been quiescent for some hours previous to the sudden explosive outbreak at 8 h. a.m.

It is possible that the prepared area near Martinique and St. Vincent Islands was receiving a further charge; absorbing a greater volume of Soletric force, and at a higher potential, owing to the sun's eclipse, as set out in the above diagram.

Soletric position at time of outbreak

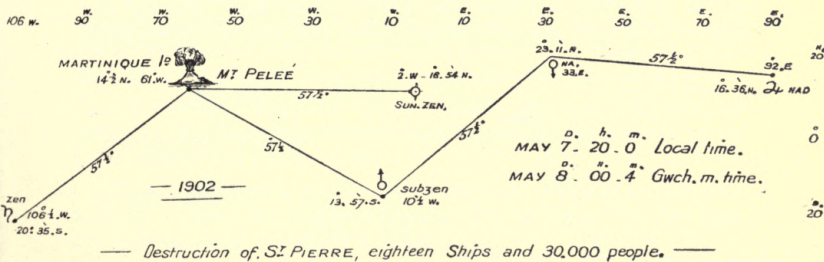


FIG. 64.

During these active eruptions of Mont Peleé, the following table shows that all the planets except Neptune took a hand.

1902. ERUPTIONS OF PELEE. TABLE OF COMBINATIONS.

May 3rd	○	☾	—	—	—	2½	—	ρ	—	"Eruption began in earnest."
May 5th	○	☾	—	—	—	2½	—	ρ	—	Sugar factory destroyed.
May 7th	○	☾	☿	♀	—	—	—	—	—	Sun eclipsed. "Boiling mud and fire."
May 8th	○	—	—	—	♂	2½	½	ρ	—	St. Pierre destroyed.
May 20th	○	☾	—	♀	♂	2½	—	ρ	—	Eruption greater than on May 8th

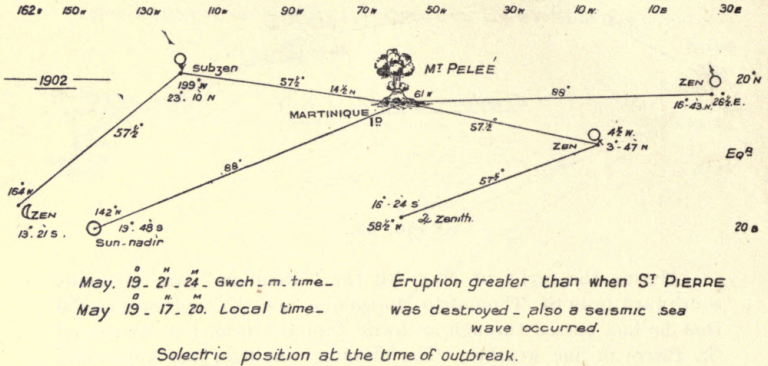


FIG. 65.

A planet in conjunction with the Sun is an explosive mixture.

MOUNT VESUVIUS, 1906.

In 1906 there was a violent eruption of Mount Vesuvius, comparable to that which destroyed Pompeii in A.D. 79.

As usual the sun gave the first warning when crossing the Equator in March, and the diagram shows that the coming eruption

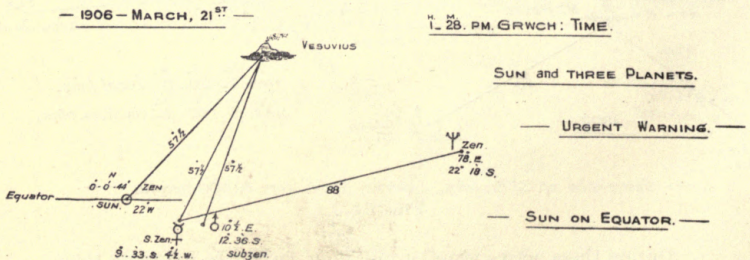


FIG. 66.

Diagram 68 shows the reason of this and gives the Solectric position at 9 h. 10 m. Italian time, which only allows the new charge 10 minutes to fire and fuse all materials.

Volcanoes are not so punctual as earthquakes, much depending on the quality of the substances acted upon, and their particular boiling point ; also the flash point of the various explosive gases in Solectric connection with good conducting material or rocks down deep in the earth.

But I can imagine some future navigator on that coast watching Stromboli which is somewhat sensitive to the attention of heavenly bodies, I can imagine the Captain remark to his Chief, " Ah, there goes Stromboli, my watch seems to be three minutes slow of apparent time." And the unbelieving Chief will say, " Yes sir, I hear they are going to arrange with Vesuvius to fire the one o'clock gun."

THE GREAT ERUPTION OF VESUVIUS, 1906.

BY FITZGERALD MARRIOTT, F.R.G.S.

My acquaintance with Vesuvius is an old standing one, as I have been up the mountain in past years nine times ; it was a piece of great good fortune that I found myself at Capri when the first signs of the volcano's recent activity became noticeable. By proceeding at once to Torre, I was in time to witness the full force of the climax of the eruption, and to see for myself the lava entering Boscotrecase. I also visited the sites of the towns destroyed by the ashes and earth tremors.

From the island of Capri on April 1st, I had seen a very dense black puff of smoke issue from Vesuvius. Again, on Tuesday, the 3rd, so I was told, another dense black cloud issued from the crater ; while on the 4th the smoke of Vesuvius became very dense and black, and a crater formed on the flanks of the mountain above Boscotrecase, the glow from which appeared very bright even from Capri—it was

stated afterwards to be 150 metres in length. That peculiar indescribable sensation, often observed in volcanic districts, had made me remark on the previous Sunday, and several times during the week, that there was a feeling in the atmosphere that seemed to foretell an earthquake or an eruption of Vesuvius on a large scale. Moreover, my barometer had not been standing very high in spite of the sunshine and a fine north-easterly breeze.

On Thursday, 5th April, Vesuvius appeared to be diminished in height owing to the amount of ash blown away. The day was dull, my barometer dropped suddenly, and continued to drop. I thought it meant rain, in fact, a heavy storm; but presently it began very slowly and steadily to rise, though the clouds increased over and around the island, and a light rain began, which lasted in fact all the evening, night, and all next morning. On Friday 6th, the barometer was still rather high and steady for the dull look of the weather. On Saturday 7th, it was at precisely the same point, and I began to think that it might be damaged. Then from Vesuvius came clouds of smoke, and in the paper at mid-day I saw that another crater had formed above Boscotrecase.

By 1 p.m. the smoke from Vesuvius was frequently black, and always heavy and thick, and I saw that the climax was near, and accordingly took the afternoon steamer over to Naples.

The first station outside Naples is San Giovanni a Teduccio, where the loud rumblings of Vesuvius became suddenly terribly audible; indeed, there being no large buildings in front to modify the vibrations would account for the attention being focussed on that violent cannonading roar that there broke the silence and eclipsed all other sounds.

Vesuvius itself could just be seen veiled in cloud, and the night was dark and stormy. To anyone who has never heard volcanic lava near or at a distance, exploding and lapping against the hidden rocks like molten iron, boiling and bursting, can hardly understand what the sound is like, for it is something peculiar to itself, and quite distinguishable to the practised ear, from the booming of cannon, which, however, it occasionally strongly resembles. It is more like sharp thunder, and sometimes like the blast of ten thousand furnaces, sudden, sharp, and often continuous.

Owing to the direction of the wind, the further we advanced the

less we heard of the volcano, but at the station of Torre Annunziata Centrale, where the train waited quite ten minutes, I saw the summit of the mountain clearly through my glasses, and at 9.20 p.m., April 7th, it was pouring out volumes of black smoke, and presently, whilst I was watching, I saw a sight that I doubt whether anyone else saw.

The top of the cone gave way at the side facing me, and a flood of lava issued, at the same time leaving two black portions of it standing right and left. As I watched, about 9.30, these also began to lean towards each other, and then quickly fell into the crater, leaving it greatly widened. Instantly there rose with a gigantic roar a flame that shot up to two thousand feet, with great streaks of lightning, and red hot stones thrown up to enormous distances. This lasted but a few moments, and then the fountain of fire kept an average height of five hundred feet, with thunder and flashes of lightning, and a terrible roaring. The eruption had commenced its greatest stage, and it proved to be one of the greatest in the history of the mountain.

The boiling noise from the new crater was as the blast of a thousand furnaces, and quite eclipsed that from the upper crater itself, and owing to the smoke and explosions it was dangerous to approach within actual sight of it. The liquid lava as it flowed was of a golden orange, and lurid smoke in which played electric flashes, covered the whole view of the crater to my left; but the lava soon became black as it passed onwards to the portions already cooling lower down, long ridges fifteen feet high, whose slow onward movement emitted a loud crackling metallic sound as the mass became broken up into millions of hard fragments that slid down one over the other.

In every direction were the remains of houses rising out of the black, streaming wastes of lava, that in places must have been thirty or forty feet deep.

On Monday, 9th, hearing that San Giuseppe and Ottajano had been destroyed on Palm Sunday, I drove to near Terzigno, and on the way picked up quantities of ashes or lapilli, of a dark yellow colour, and grey pumice and solid lava-stones.

From the roofs of the houses everywhere people were sweeping the ashes in great heaps into the streets, and it was as well to look out for these or ride in the centre of the road.

When we reached San Giuseppe, the ash must have been at least a foot or more deep, it having fallen from 9 a.m. to 8.30 p.m. the previous day, Sunday April 8th. In the piazza on a bench were seated two officers; in front of me was the church of Sant Antonio, whose roof had fallen in with the weight of ashes and lapilli, burying more than two hundred people who had crowded there the more numerously that it was Palm Sunday. The walls were still standing. Soldiers were removing the debris, and carrying out the bodies.

The aspect of these half buried and absolutely ruined towns of San Giuseppe and Ottajano recalled to mind vividly what must have been the actual experience of the people in the destruction of Pompeii.

When I reached Naples, religious processions of poor people, carrying pictures and images, were still continuing and people of that class were still crying to San Gennaro and promising aloud that they would never commit any sins again. Though the climax of danger is considered to have passed, yet the volcano will probably continue to show signs of considerable activity for at least another couple of years at intervals. The whole earth, owing to the changing of its axis, is in a state of internal convulsion.

It will be noticed that Mr. Marriot accounts for the eruption by stating that "the whole earth, owing to the changing of its axis, is in a state of internal convulsion." In such case the bearing of the North Star would be altered; but it remains the same. However, the diagnosis of an ailment is often difficult. I recollect saying to a Negro in Sierra Leone one day—

"Your poor monkey is crying so much, he appears to be suffering internal pain."

"No Sah," was the reply, "de monkey he no suffer internal convulsions Sah; he got jigger in his toe, and jigger now wake ap and eat him."

In the next example three volcanoes are in action together as reported in the "London Chronicle." These mountains are situated on the same meridian within one degree, so that when a strong force in a north and south direction strikes that meridian, they are liable to blaze in sympathy.

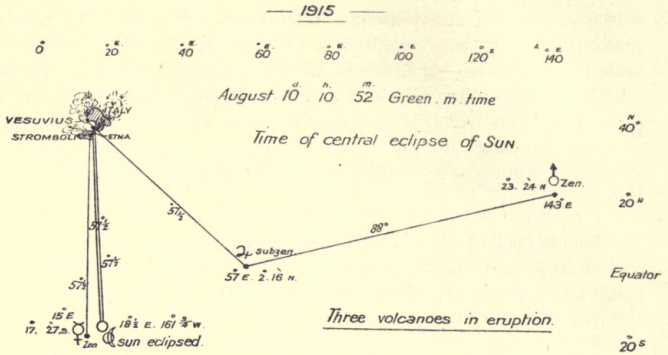


FIG. 69.

The diagram shows that there was an annular eclipse of the sun at the time and these mountains were within Solectric range.

The account is as follows :—

“ London Chronicle ” of 13th August, 1915.

VESUVIUS, ETNA AND STROMBOLI.

ROME, August 11th. (Received yesterday).

En route from Athens to Naples aboard the Greek steamer “ Adriaticus ” those on board witnessed a joint reawakening of the three great Italian volcanoes, Mount Etna, Stromboli, and Vesuvius, which culminated 10th August in opening two new craters in Etna and a dozen earthquake shocks from Vesuvius southward.

Immense clouds of steam and smoke, issuing from all three volcanoes, were visible from the sea all day as the steamer successively passed and receded from each.

Dispatches from Catania to-day announce that lava streams

flowing from new openings in the eastern side of Mount Etna, threaten to destroy the English casino at Messina.

The population were greatly alarmed, and there are clamours for the traditional procession with the Madonna della Lettera. The entire atmosphere about Naples is clouded by wind-carried smoke and steam.

At Stromboli flames were seen issuing, while the lava was running into the sea.

The next diagram, August 10th, 12 h. 21 m. G.M.T. shows the sun still under eclipse and it shows what the combination is doing on its other side to the westward.

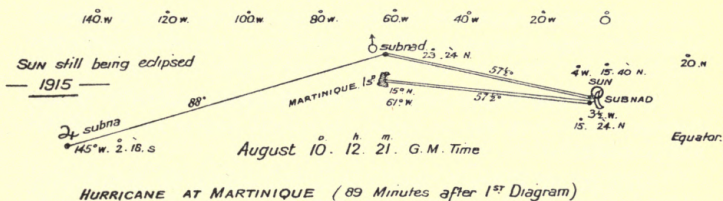


FIG. 70.

A telegram from Paris on August 11th, 1915, says: "Martinique reports that a fierce hurricane swept over the town at 8 h. 30 m. yesterday."

The diagram works out for about nine minutes earlier than the time stated in the report.

STROMBOLI VOLCANO.

Reuter sends the following telegram from Rome to the press, November 13th, 1915.

"The observatory at Catania, Sicily, announces that there was a violent eruption of the Stromboli volcano at 9 h. 15 m., a.m. Great rocks, stones and ashes fell all over the island of Stromboli and there was a large quantity of lava."

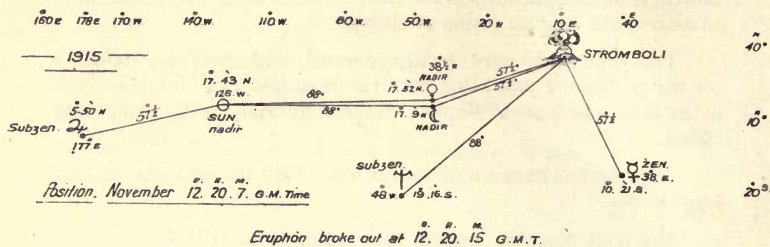


FIG. 71.

The diagram computed for eight minutes previous to the stated time of eruption makes the causes quite clear and simple, and the occultation of Uranus by the moon was one cause.

I have dwelt rather long on these European volcanoes merely because I have been able to obtain the correct time of the outbreaks and eruptions.

Some of my letters to distant countries asking for information for the sake of scientific research received no answer, and others merely an evasive reply. But I turn with pleasure to two examples of courtesy to my bothering inquiries.

The "Standard" reported that on the night of August 14th, 1911, a large party of foreigners and Japanese ascended the volcano of Asama for enjoyment. Arrived at the summit many were taking luncheon when suddenly the volcano exploded and four persons were killed and thirty-three injured.

Thereupon I found from calculation that the sun had given a warning when on the Equator, on March 21st (in 95° E.), also on August 6th, 6 h. 20 m., there was another warning. I wrote to Japan giving the calculated time of this explosion as August 14th, 16 h. 48 m., local astronomical time, equivalent to 4 h. 48 m. a.m. of August 15th.

My letter was sent on by the British Consul to Mr. F. Omori, Secretary of the Imperial Japanese Earthquake Investigation Committee.

Mr. Omori replied fully and said that particular explosion happened on August 15th, 4 h. 45 m. 48 s. a.m., a difference of 2 m. 12 s. from my time by calculation.

Early in the year 1913, I noticed in the Melbourne "Age" an account of the Chilian barque "Belfast" being towed into Sydney in a crippled condition from loss of masts and with all compasses and chronometers useless.

She had been through an electrical storm. I worked the position of the barque from the account and sent it with diagrams to my friend Mr. David Reid, Manager of the Orient Line, Sydney.

I asked Mr. Reid to obtain from the Captain of the "Belfast" the ships actual position and the correct time of accident, so that these might be compared with results given by Solectric calculation. My longitude proved fairly accurate differing about $\frac{1}{2}^{\circ}$ from "precise longitude" sent in reply.

The "precise latitude" differed some degrees from my position but as storms extend over a large area this was not serious.

The Greenwich time of occurrence was given as 1912, December 15th, "11.30 p.m."; my calculated Greenwich time being December 15th, 0 h. 30, G.M.T.

So I wrote a second time to Sydney saying the Captain must be mistaken.

In due course Captain Parajon replied that he had sent me the local time of the accident marked Greenwich in error, so there was finally a difference of 11 minutes only between my calculated time and the time of occurrence.

Such items as the above were encouraging, and I have been thankful to those who amid the stress of their own work could "bear fools gladly," for my inquiries would appear strange to many.

Some years ago the "Syren" published a smashing review of an earlier work of mine on Solectrics. I was astounded to find that in order to make out a case, the reviewer had changed two of my given dates by a year each. And the steamers which I had depicted as struggling amid heavy seas "were snugly in dock at the time" so it was stated. The "Syren" published a correcting paragraph after an interview; but the review writer who adorns a certain Meteorological Society not far from the metropolis never apologised, and I fear he still suffers when conscience gnaws.

Ignoble acts may bring a present gain
But comes remorse with never ending pain.

The Peak of Teneriffe had been dormant for 111 years when telegrams were despatched from the Canary Islands on November 18th, 1909, which stated that the peak of Teneriffe volcano had begun to erupt flames, stones and cinders.

After several earthquake shocks three craters opened on the peak, and lava was flowing down the mountain sides. The villages in the neighbourhood of the craters had been abandoned.

Some days later it was reported that the "chief crater continues to throw out incandescent matter to a height of over 2,000 feet, the eruption thus affording a magnificent spectacle. The flow of lava increases in volume."

As already mentioned, there was a warning on September 23rd, during the time the sun was crossing the Equator, and a warning on the same day by the moon.

It took a considerable amount of Solelectric irritation to wake up the grand old peak, which is visible 100 miles, and is a dignified ocean milestone.

September 29 d. 7 h. 50 m. Moon on Equator 88° from Teneriffe.

October 5 d. 14 h. 22 m. Moon extreme declination N. $=88^\circ$ to Teneriffe.

October 20 d. 9 h. 50 m. Moon extreme declination S. $=88^\circ$ to Teneriffe.

November 1 d. 23 h. 0 m. Moon extreme declination N. $=88^\circ$ to Teneriffe.

The three following diagrams further explain the manner of Solelectric action which brought about the eruption.

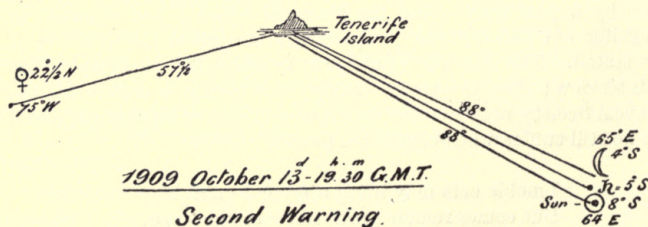


FIG 72.

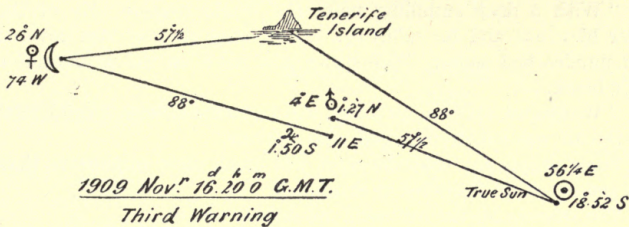


FIG. 73.

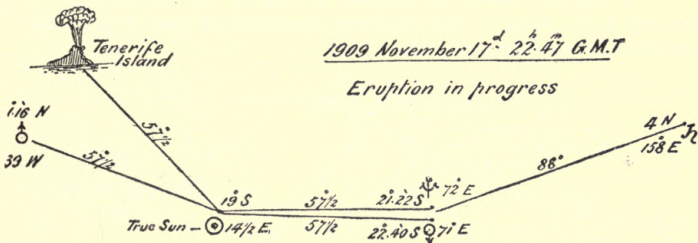


FIG. 74.

The following telegrams give an account of an eruption of Ngauruhœ volcano in New Zealand in 1909.

WELLINGTON, N.Z.,

March 9th.

“Ngauruhœ volcano is in active eruption; loud reports are heard and thick volumes of smoke are ascending. Sand and lava are running down the slopes of the volcano. Smoke and steam are rising to a height of 3,000 feet.”—Reuter.

WELLINGTON, N.Z.,

March 10th (“Standard”).

“A spectacle of sublime grandeur has just been witnessed at the eruption of the Ngauruhœ crater of the volcano Tongariro.”

"With a deep rumbling noise the whole western side of the crater blew out and for miles the surrounding country was covered with pumice and ashes. This turned the snow on the mountains a dingy black.

"Wanganui, sixty miles away, was surrounded with a thick haze and the air was heavily charged with sulphur."

Some people say that the sight was much more impressive than that presented by Vesuvius or Stromboli.

The reasons for the outbreak are not far away.

On February 28th, 7 h. 8 m., the sun and Jupiter played Solectric force through Tongariro district; also on March 1st, when the moon was at extreme declination, the sun and Jupiter again acted on the mountain and were assisted by Saturn and Neptune.

The diagram shows the position on March 9th 3 h. p.m., New Zealand time, when a very explosive combination passed over the already fully charged mountain.

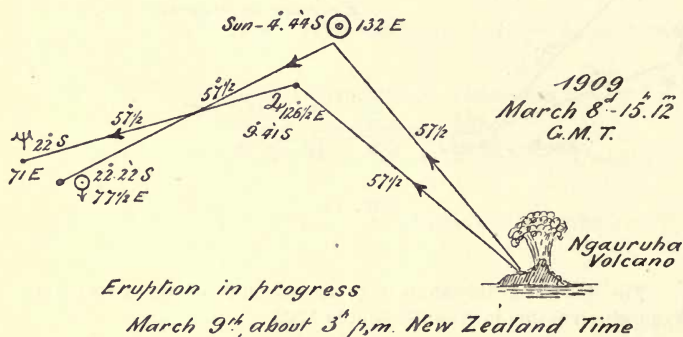


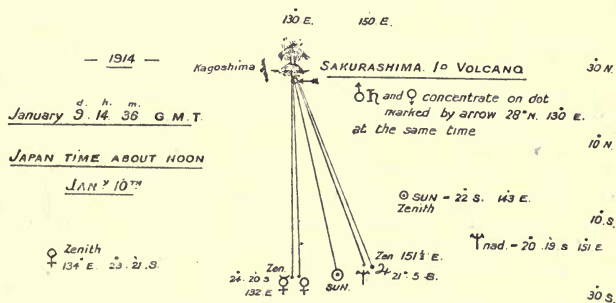
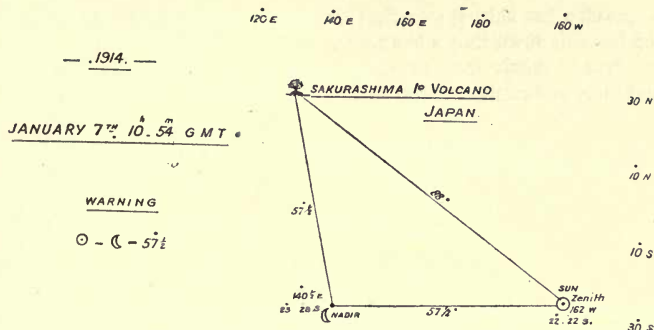
FIG. 75.

The last example is taken from Japan.

It was most violent, and many earthquakes occurred, no doubt owing to the severe shocks the mountain received. Blocks of lava the size of houses were thrown up, and lava stone blocked the railway 230 miles distant.

The sun and four planets were acting on Sakura, without the moon; the other three planets acted in a spot on the same meridian but a few degrees further south.

The two diagrams will illustrate the causes of the disastrous event.



There were other warnings, on November 1st, 1913, at 20 h. 00 m. G.M.T., moon on extreme declination ; also on December 20th, moon crossing Equator.

The following interesting account of this volcanic eruption is derived from cabled descriptions which appeared in various newspapers, dated January 13th to 15th, 1914.

In reading the details of fire, eruptions of tremendous force, flames and earthquakes, great sea waves and a typhoon with compasses spinning round, heavy rains and awful noise, we may well ask, if we must still believe that some interior strata slipped over some other strata and perhaps fell into a hollow ; or that the earth's centre

of gravity has shifted ; or that the earth has sprung a leak and the sea has run down into a hot place.

These things may possibly happen ; but still, we seek a prior and more sufficient cause to satisfy our judgment.

GREAT VOLCANO DISASTER.

HEAVY LOSS OF LIFE.

FROM OUR OWN CORRESPONDENT.

TOKIO,

January 13th, 1914.

Terrible havoc has been caused by the eruption of the volcano of Sakura-jima, on an island in the Gulf of Kagoshima, in Southern Japan.

The town of Kagoshima, which is on the mainland several miles from the island and is surrounded by a volcanic range, has been overwhelmed. The inhabitants (over 70,000) have abandoned the city.

Owing to the breakdown of the telegraph service Kagoshima is now cut off. The gravest fears are entertained for the safety of the fleeing population.

Because of its spectacular character the disaster has excited even greater interest than the famine conditions in Northern Japan, where ten million are face to face with starvation.

Mount Kirishima, thirty miles north of Kagoshima, has also burst into volcanic activity, causing great devastation. Mount Asama, in Central Japan (the largest of the active Japanese volcanoes), is also active. Professor Omori, who holds the chair of seismology at Tokio University, anticipates continued volcanic disturbances.

TOKIO, Tuesday.

The first eruption of Sakura-jima occurred on Saturday morning, 10th January, 1914. Enormous blocks of stone were thrown to a height of over 2,700 ft. and some fell at a distance of twenty miles.

Streams of molten lava flowed down the side of the mountain, overwhelming three villages. Fire spread to the forest on the mainland, and further eruptions carried the burning lava to Kagoshima, which was set on fire. The inhabitants fled in all directions, but probably hundreds were killed. Refugees crowded into trains of goods wagons which left for the north, and by evening Kagoshima was deserted.

A telegram yesterday afternoon reads : " The operator is the sole official left at the Kagoshima office. All the others have fled

and the city is deserted. The whole place is covered with ashes and smoke. The earthquakes are more and more horrible."

It is reported from Hitoyoshi (thirty-five miles from Kagoshima) that by noon the island of Sakura-jima was completely enveloped in flames. The refugees first fled to Kagoshima; but, owing to the increasing flow of lava, the citizens escaped northwards by train. Yesterday evening further eruptions destroyed the railway line for a distance of eight miles.

Squadrons of warships are on the way.

EYE-WITNESS'S STORY.

A refugee who has reached Nagasaki says that from Sunday morning to 10 o'clock on Monday, when he left, there had been over 200 earthquake shocks in Kagoshima. He says that the inhabitants of Sakura-jima thronged the beach of the island, and the police of Kagoshima, commandeering a number of lighters, proceeded to the island to take the refugees off. The heat from the volcano could be felt even in Kagoshima City, where the sky was darkened with the smoke. The island, enveloped in flames, the brilliance of which was constantly enhanced by eruptions, presented a magnificent spectacle.

According to official advices, a tidal wave added its terrors to the situation, hundreds of houses were destroyed or damaged, and many of the inhabitants were killed or injured.

Nagasaki, 100 miles from Sakura-jima, is covered with a fine deposit of volcanic ash.—*Reuter's Special.*

Kagoshima is a seaport on a large bay at the south end of Kiushiu Island, and is the southernmost great city of Japan.

From here tourists proceed to the celebrated volcano on Sakura-jima. The mountain is about 4,000 ft. high and has two craters. The last eruption took place 134 years ago.

DESTRUCTION OF KAGOSHIMA.

TOKIO,

15th January, 1914

A telegram from Kumamoto says :—

"Yesterday evening the west side of the volcano of Sakurashima blew out. All sides of the volcano and the summit are vomiting fire furiously. The sea is boiling, and a tidal wave has swept the city again. A second cruiser squadron arrived last night, and further troops are being rushed to the danger-points.

"Yesterday evening recurrent earthquakes destroyed houses, roads, and the railway. For miles the aspect of nature has com-

pletely altered, and horrible scenes are to be witnessed. The fall of ashes is so heavy that it is almost impossible to open one's eyes. The situation is most dangerous, and the Observatory predicts further and worse eruptions. Thirteen thousand houses have been destroyed, and over 70,000 persons have fled or are missing."

The first refugee from Kagoshima arrived in Tokio last night. In the course of an interview, he said that the rumblings and eruptions began on the 10th inst. The most hideous noises were heard. Not a person slept; all prepared food, and packed for emergencies.

The populace flocked to the seashore, and saw an enormous rent in the side of the volcano, one-third of the way up.

"From this gap the thickest smoke and fire were belching forth, rising a thousand feet in the air. Shortly after three other rents were visible, from which huge red-hot rocks were flung forth. The flames were terribly fierce, enveloping the island. This was followed immediately by a terrific eruption from the summit, and the sky seemed to rain fiery substances over everything.

"No mortal words can describe the magnificent but terrible scene."

15 FEET OF ASHES IN CITY.

NAGASAKI,

14th January, 1914.

Wireless messages from the warships sent to Kagoshima report that the island of Sakura-jima (the scene of the volcanic eruption in Southern Japan) is completely doomed.

It is shrouded in black smoke, through which the flicker of flames can be seen. The bay is covered with lava that has flowed down from the volcano. The City of Kagoshima is covered with ashes to a depth of 15 ft. Fissures, both deep and wide, run in all directions.

The loss of life is believed to be very heavy. From three of the villages on the island of Sakura-jima there are no refugees. The means of rescue proved inadequate, though the crews of launches and sampans (skiffs) worked heroically, plying to and fro between the island and the mainland amid a hail of incandescent stones and boulders.

Many fugitives were drowned in trying to swim across the strait. Others were suffocated by the poisonous gases from the earthquake fissures. Refugees state that the heat from the flames rising from the mountain side made it impossible for the boats to use the channel on the east side of the island.

The earthquakes and eruptions have now subsided, but appalling rumblings in the earth still continue and a typhoon is blowing. An

official report states that 600 houses collapsed under an especially violent shock on Monday and that the shaking of the earth afterwards was so great that it was impossible to walk upright, and people had to crawl and stumble out of the city mainly on their hands and knees.—Reuter's Special.

TOKIO, Wednesday.

The captain of the Japanese cruiser "Tone" has sent a wireless message saying that not a single person is left at Kagoshima. A report has been received that a ship which took on board 307 refugees after the first volcanic outbreak sank during the second eruption.—Reuter's Special.

Ashes fell at Osaka, about 300 miles from the volcano, and a tidal wave flooded the coast of Osaka Island.

This is another dread example of what follows when all the heavenly bodies become concentrated on a small area.

Explosions in Coal Mines.

My attention was called to these very sad accidents by the disaster at Senghenydd, South Wales, in October, 1913.

In the best managed collieries, both at home and abroad, and in mines often considered very safe, explosions with loss of life take place. It is absurd to conclude that these direful events are always due to neglect, or wilful disobedience of the regulations by the very persons who are certain to suffer most when accidents happen.

It appears after investigation, however, that many coal mine explosions could not have been prevented ; in fact, they were brought about by natural causes, namely, a solectric combination of an explosive potentiality.

This quality of combination consists of the sun and threeplanets usually. Rarely the moon takes a hand and only under exceptional conditions are two planets powerful enough to cause an explosion.

This chapter and the next will consist largely of diagrams and a mere statement of the events illustrated.

A study of the diagrams will enable an earnest student to discover the natural laws ruling these remarkable phenomena.

In the future a Socratic Council foreseeing that a certain district is menaced, will order all underground workers to the surface a day beforehand. In such case we should only have material damage to deplore.

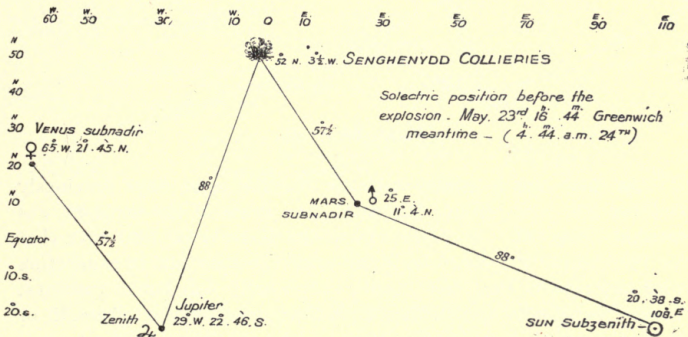
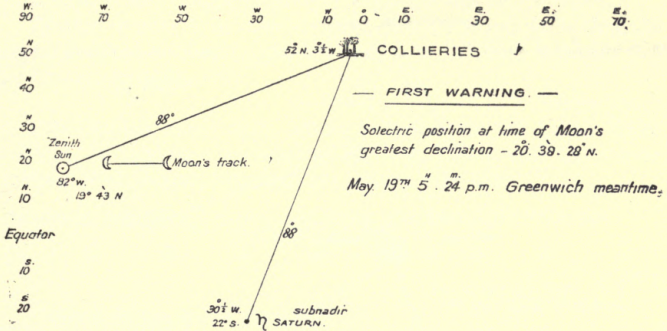
While all cases so far investigated have worked out in extraordinary harmony with the solectric theory, one or two are a little discordant.

For instance, if an explosion occurs within 20 minutes of a combination falling over an area previously threatened, one may be sure that the explosion has been the work of the sun and planetary assistants.

If the mine is very large and well ventilated an explosion may be delayed up to 40 minutes ; and the same may be said in case the exploding combination is weak, consisting say, of only two planets and the sun.

Any such delay as 40 minutes would cause an element of doubt as to the reason of the accident, and a longer interval between the supposed cause and the effect would in my opinion rule out " Natural causes " as an explanation of the accident.

— 1901. —
 Explosion at SENGHENYDD COALMINE, SOUTH WALES.
 about 4.50^m a.m. May 24th
 — 84 MEN KILLED —



FIGS. 78 & 79.

Diagrams Fig. 78 and Fig. 79 refer to an explosion which occurred at Senghenydd Collieries, South Wales on the morning of May 24th, 1901.

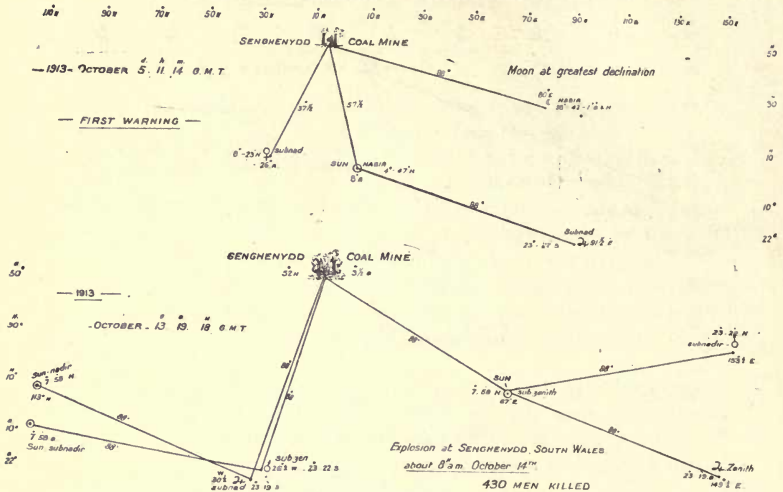
Eighty four miners lost their lives.

Four days and a half previously, when the moon was at extreme declination there was a valuable warning given.

On the morning of May 24th a strong fiery Solelectric combination passed over the mines and within six minutes there was an explosion which killed all those below ground except one.

Twelve years and some months later, a second and more dreadful

explosion took place at the same colliery. Four hundred and thirty men were killed on October 14th, 1913, at about 8 h. a.m., Figure 81.



FIGS. 80 & 81.

As there was a serious Solectric warning eight days previously October 5 d. 11 h. 40 m., Figure 80, the cause of the accident was certainly Solectric. A comparison of the diagram for 1901 with that for 1913, shows the sun to be in sub-zenith position and in connection with two planets Mars and Jupiter at sub-nadir and zenith positions. These two planets were acting from the same positions of zenith or nadir as in 1901.

In 1913 the sun from its nadir positions was still in touch with Senghenydd through Mars and Jupiter.

In March, 1901, and in March, 1913, the sun's centre was within a mile from the Equator, when 88° from the Senghenydd coal mine.

Thus there are many similarities between the causes of the accidents in 1901 and in 1913.

One point is against the theory and that is the lapse of time which occurred between the action of the combination and the stated time of explosion.

I think this is due to the presence of only two planets, although those planets also attack from opposite sides with the sun, as depicted.

The size of the mine and excellent ventilating machinery may have delayed the explosion.

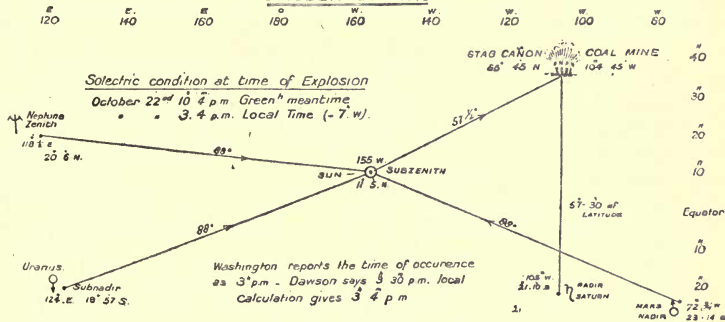
The destruction of the Japanese battleship "Mikasa" September 10th, 1905, is an example of another explosion similarly delayed.

Future inquiry may clear up this point. My opinion is that the second accident at Senghenydd was caused by Solectric action as was the first one in 1901.

On October 22nd, 1913, about a week after the South Wales accident, an explosion occurred at the Stag Cañon coal mine, near Dawson, New Mexico, by which 261 miners were killed.

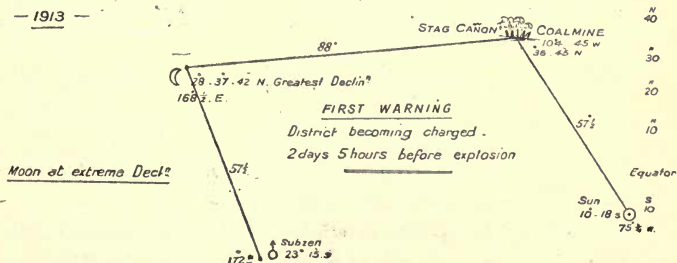
Explosion at "STAG CAÑON" COAL MINE, near Dawson, NEW MEXICO 260 MEN KILLED

— OCTOBER 22nd 1913 —



Below is given the solectric condition on October 20. 4. 48 Greenwich mean time when the Moon was within 0.5 of greatest declination.

— 1913 —



FIGS. 82 & 83.

I wrote to Washington and New Mexico for details, and received a courteous reply from the State Governor W. C. McDonald, also the following from the Bureau of Mines, Washington.

“Unquestionably, fire damp was not a factor in this explosion ; coal dust was responsible and its ignition is thought to be from improper blasting.”

The diagrams, October 20 d. 4 h. 48 m., Figure 82, warning, and October 22 d. 10 h. 4 m., Figure 83 at time of explosion render the causes of this accident very manifest. There is the usual warning at moon's extreme declination time, and 2 d. 5 h. afterwards a Solectric combination of so great power that the mine blows up at the moment. There are four planets assisting the sun, and no mine containing explosive dust, or ship containing ammunition could pass under such a force without destruction.

I hope that after study of these diagrams the United States Bureau of Mines will be of the same opinion. In that case miners will be saved, for collieries will not be worked on those dangerous days. And those days are not difficult to compute by anyone familiar with astronomical problems.

When the Manager of Senghenydd Colliery was on trial in regard to the dreadful explosion there, I offered to give evidence that in all probability the mine was fired by natural causes. No reply was received ; offer evidently considered to be nonsense. Again, in a case arising out of the loss of H.M.S. Bulwark (*Lock versus Army and Navy Assurance Co.*) I offered evidence of the ships loss from natural causes, but the offer was refused.

So to another example with the object of amassing evidence which cannot be refuted.

On January 30th, 1914, a German coal mine blew up killing about 50 men.

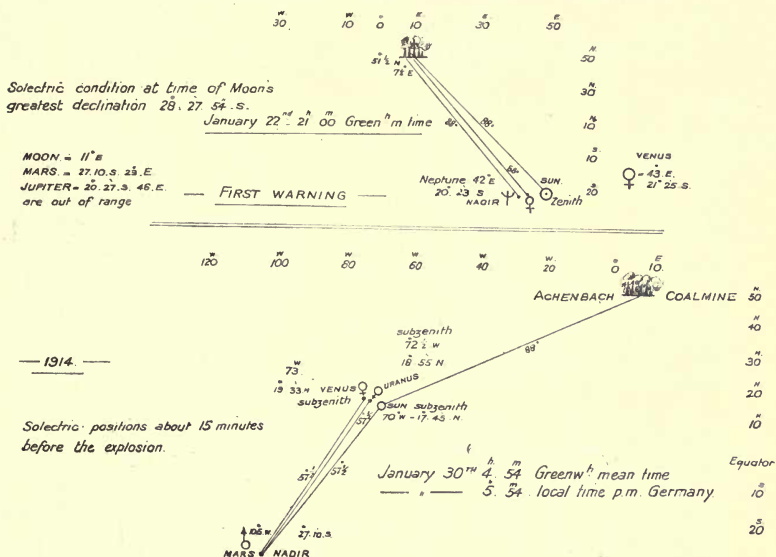
A message from Dortmund says, an explosion caused by fire damp took place to-day (30th) in a mine at Achenbach, Westphalia. From 60 to 80 men are still in the mine.

The explosion occurred shortly after 6 h. in the evening. Twenty-two dead and seventeen men have been recovered up to the present.

The diagrams Figure 84 and Figure 85 show that there was a warning a week in advance, when the moon was at extreme declination, and the sun with two planets threatened the mine.

About 10 or 15 minutes before the explosion on January 30th, three planets assisted the sun to detonate the already charged mine and nothing could save it.

1914. Explosion at ACHENBACH COALMINE WESTPHALIA GERMANY on January 30th 1914
shortly after 6^h pm locally - about 50 MEN KILLED



FIGS. 84 & 85.

BARNESLEY.

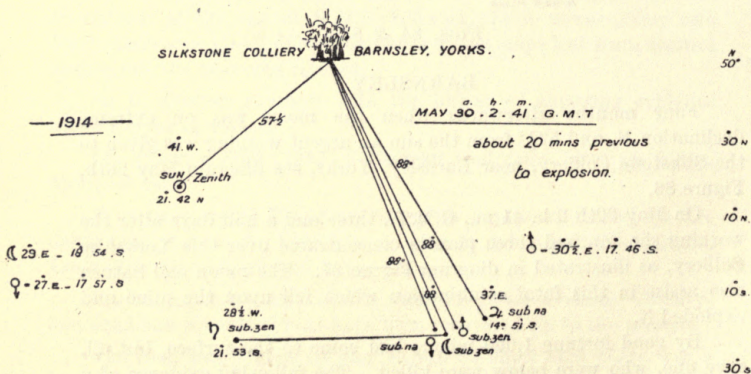
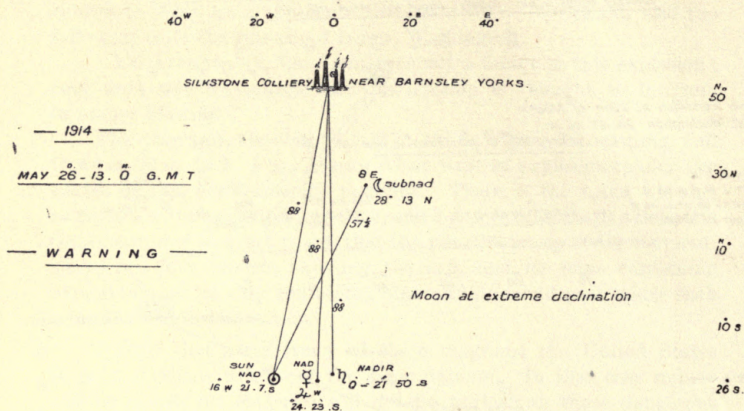
Four months afterwards when the moon was on extreme declination N. and $57\frac{1}{2}^{\circ}$ from the sun an urgent warning was given to the Silkstone Colliery, near Barnsley, Yorks, see diagram May 26th, Figure 86.

On May 30th 2 h. 41 m., G.M.T., three and a half days after the warning the sun and three planets concentrated over this Yorkshire Colliery, as illustrated in diagram Figure 87. The moon and Saturn also assist in this fatal combination which fell upon the mine and exploded it.

By good fortune 1,000 miners had come to the surface, but all, save one, who were below were killed. The following evidence of a survivor well describes the case.

Maycock, a collier of High Green, had a miraculous escape. When seen at his home his face was terribly burned, and he was suffering from cuts on his head and face.

He stated "that there had been no previous warning of gas



Eleven lives lost - the other 1000 had come up for week end. -

Accident happened about 3pm on Saturday

FIGS. 86 & 87.

danger. Thirteen men were working in the Winmoor section. The general body of colliers had cleared out about two hours before. The men who remained were engaged in boring in a by-way, and all went well with the work for a time. It was found necessary to consult the deputy on a certain matter, and he (Maycock) went away to find him.

“LIKE A MIGHTY WIND IN A GALE.”

He had left the working place only a few seconds, when he heard a noise like “a mighty wind in a great gale.” He was immediately thrown off his feet and carried at least ten yards along the main way. He was badly stunned, but he did not lose consciousness. He saw a great flame rush past him and felt the fire on his face. His clothes were soon ablaze, but he put the flames out, and as soon as the roar had ceased, he struggled to his feet and informed the men in the pit of what had happened. He then crawled along to the pit-bottom and there communicated with other officials, and in a very short time rescuers descended. All the men who had been working with Maycock were killed.

The pit was regarded as one of the safest in Yorkshire. It was kept scrupulously clean and was always well regulated. This may account for the fact that the area of the explosion was not larger and that the seam did not take fire afterwards. When the rescuers reached the scene of the explosion a great distance from the shaft, they found that all danger of further accident was over, but great havoc had been caused within a limited area.

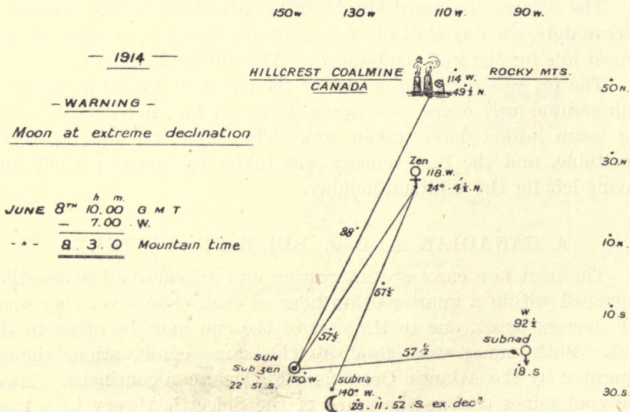
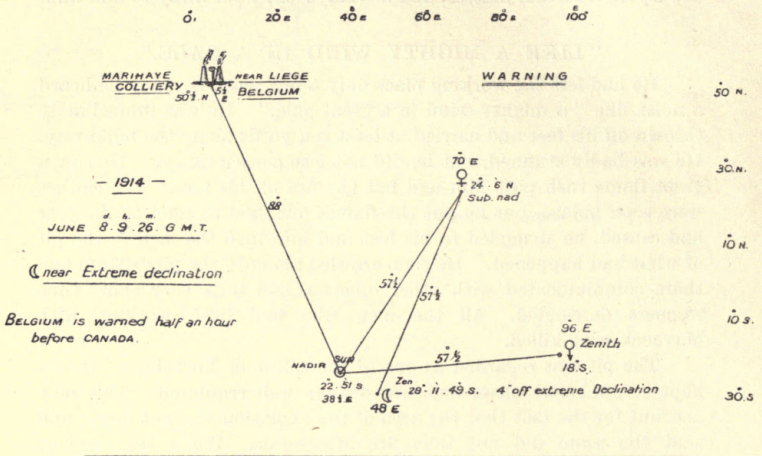
The disaster occurred shortly after 3 o'clock in the afternoon. Fortunately, the day shift of over 1,000 men had left, and the pit was almost idle for the week-end and the Whitsuntide holiday.

The pit was regarded as one of the safest in Yorkshire and was kept scrupulously clean. Certainly if the pit had not been so clean the seam would have taken fire. The explosion was, however, inevitable, and the best remedy was taken by chance; 1,000 men having left for the Whitsun holiday.

A CANADIAN AND A BELGIAN COLLIERY.

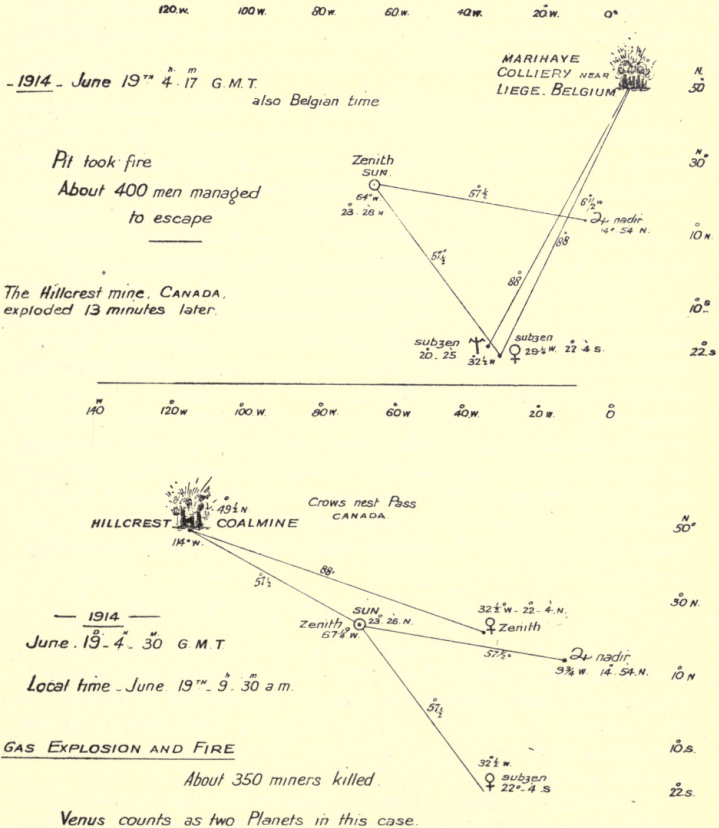
The next two cases are interesting and instructive because they happened within a quarter of an hour of each other—yet they were 120 degrees apart, one to the east of the sun and the other to the west. Both mines were fired by the same combination, though separated by the Atlantic Ocean and N. American continent. These two coal mines declare the truth of the Solelectric theory in a most remarkable manner.

Both the affected mines were warned on June 8th, Figures 88 and 89, about ten days before the accidents by the same combination—and both firing combinations included Venus and Jupiter. The



FIGS. 88 & 89.

Belgian mine did not receive the direct stroke from the sun, it came through Venus ; the Canadian mine received the sun's power from zenith position. The former mine did not explode but took fire ; see diagrams June 19 d. 4 h. 17 m., Figure 90 and June 19 d. 4 h. 30 m., Figure 91.



FIGS. 90 & 91.

The following newspaper cuttings will serve to describe the accidents, and positions of the pits in Europe and America.

CANADIAN COLLIERY DISASTER.

SEVERAL HUNDRED KILLED BY EXPLOSION.

MINE IN FLAMES.

TORONTO, *June 19th, 1914.*

A dispatch from Winnipeg just received says that 200 miners have been killed in the Hillcrest mines in the Crow's Nest district, Alberta, to-day by a terrific explosion.

Later.

Later dispatches show that one of the worst mining disasters in the history of the Crows' Nest Pass district occurred this morning. Details are still meagre, but the official reports of the Canadian Pacific Railway estimate that the number of dead is 200.

Immediately on the receipt of the news a rescue car was sent from Blairmore and a special left Calgary at 1.30 this afternoon for the mine, carrying doctors, nurses, and medical supplies.

As black smoke is issuing from the pit mouth it is believed that the situation is very serious. The explosion occurred at 9.30 this morning, and the mine in a few moments was completely ablaze. Fifty men were taken out, but it is not clear from the dispatches whether they were dead or alive.

WINNIPEG, *June 19th.*

The Canadian Pacific offices here have received advices reporting an explosion at the Hillcrest coal mine near Fernie, B.C., which is likely to prove one of the worst disasters in the history of Canada. Six hundred men are reported to have been killed. The message says that a terrific volume of smoke is coming from the mouth of the mine accompanied by flames.—Reuter.

THE CROW'S NEST PASS COALFIELDS.

The Crow's Nest Pass coalfield in about $49\frac{1}{2}^{\circ}$ N. and 114° W., lies immediately west of the summit of the Rocky Mountains in the Crow's Nest Pass. The greater part of the coalfield is situated in the province of British Columbia, except a small portion in the immediate neighbourhood of the Pass, which crosses the watershed into the province of Alberta.

The Hillcrest mines, where the disaster has occurred, are on the Alberta side. The total area of the coal-bearing district is about 230 square miles. The seams are extremely rich, and according to a careful estimate, average about 100 ft. in thickness. The cost of winning the coal is comparatively low, since the mining begins practically from the surface, no shafts being sunk. Tunnels are dug

into the coal seams horizontally, rails are laid, and the coal brought out on trolleys.

Fan ventilation and other modern appliances are used to remove inflammable gases. Only a small portion of the coal goes direct to the market. The greater part is converted into coke and shipped to smelting works in British Columbia or in the United States, from which the coalfield is only 40 miles distant. The quality of the coal is excellent, and many workable seams of anthracite have been discovered within the last few years.

BELGIAN COLLIERY ABLAZE.

LIEGE, *June 19th, 1914.*

A fire has broken out in the Vielle Marihay Colliery in this district. There were 400 men in the mine at the time of the outbreak, and of these 200 were imprisoned below for some time, but all were ultimately rescued. The fire is spreading.—Reuter.

The colliery is situated in about $50\frac{1}{2}^{\circ}$ N. and $5\frac{1}{2}^{\circ}$ E.

The Diagrams (figs. 88, 89, 90 and 91) explain these dreadful colliery accidents in a simple manner.

In nearly every case adduced there are more warnings issued by Nature of her intentions than I have figured in this book. It will be the work of Solelectric Councils and Almanack makers in the future to have a list of planetary distances always prepared. Mistakes of interpretation will arise at first, but it is better, for instance, to stop work at a colliery for one day than lose half the men.

The firing combination includes the sun nearly always, and on the sub-Zenith or Zenith positions, but principally the former. Experience will enable us to state definitely what results will follow each particular position.

The last example of colliery explosions is taken from Japan, and is illustrated by diagrams (Fig. 92, 93 and 94, September 23rd, November 26th and November 27th respectively).

A little history is attached to this very serious accident.

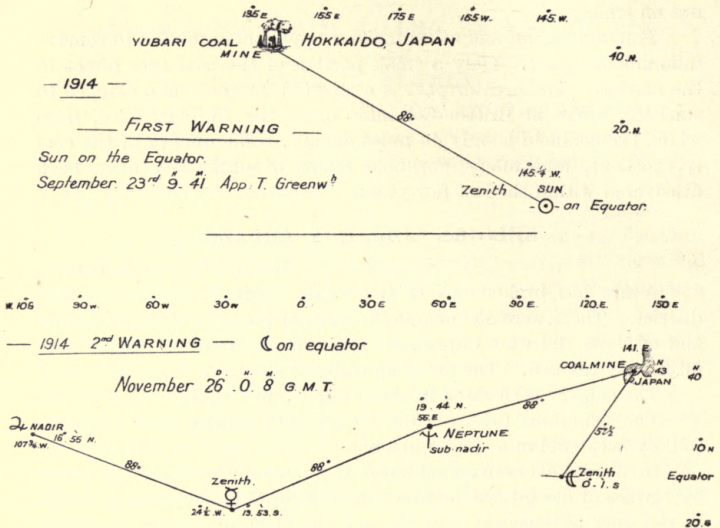
I noticed the following two lines of news in the "Daily Mail" during the first week of December, 1914.

JAPANESE MINE DISASTER.

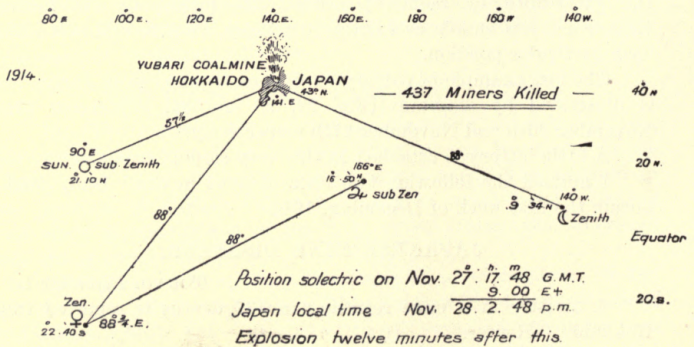
TOKYO, *December 1st.*

A disaster in a mine resulting in 437 deaths is reported from Hokkaido.—Reuter.

Such a terrible accident demanded investigation. As Hokkaido was not marked in my atlas, and the date of the accident is not given, I endeavoured to find the correct date and position by calculation.



THIS IS THE THIRD WARNING



FIGS. 92, 93 & 94.

It was a tough proposition, but after some days I wrote to the Consul-General of Japan in London, sending diagram and asking for information, in order to correct my calculations.

On some occasions my intrusive enquiries are replied to with courtesy, and this occasion was one of them. The Vice-Consul, Mr. T. Okamoto said, on December 10th, 1914 :—

“ I beg to acknowledge the receipt of your letter of the 7th inst., desiring to obtain certain data with regard to a coal mine explosion in Hokkaido which has been reported in the Press, and to state in reply that I have not received any definite news of this accident further than the information appearing in the newspapers here.

“ I shall be pleased, however, as soon as I receive the Japanese papers giving an account of the accident, to communicate to you such facts as referred to in your letter, in the case of their being mentioned in any of the papers.”

I gave the date of accident in my letter as November 28th, and the mine position as 43° N. latitude and 140° E. longitude, by calculation.

On January 21st, 1915, I again heard from Mr. Okamoto, who wrote : “ Referring to your letter of 18th inst., I beg to inform you that according to a Japanese newspaper we had a colliery explosion at Yubari, Hokkaido, Japan, on the 28th November last, at 3 h. p.m. I am afraid that as the report is not official the time may not be quite accurate.”

“ The place is situated in 43° N. latitude and 141° E. longitude.

“ As regards the explosion on board the “ Mikasa,” I do not think we have at hand any details concerning it.”

Thus by pure calculation the day, also the latitude and longitude of the place were correctly found.

The longitude by calculation differs one degree from the actual, but the calculation gives an affected area, not a point, and that is sufficiently accurate.

The day is correct, but I find that the actual hour differs somewhat from that by calculation, because I used the sun's sub-nadir position in place of sub-zenith.

Diagram for November 27th, 17 h. 48 m. G.M.T., is calculated correctly. See Fig. 94.

But I appreciate the kindly suggestion of the Vice-Consul that the hour stated by newspaper “ may not be quite accurate,” when in reality I think my work required a little correction in this particular.

Jupiter and Venus are conspicuous agents in this explosion ; they were equally so in the two last explosions, at Liege and Hillcrest mines.

Explosions on War Vessels.

THE "MAINE."

Early in the year 1898 diplomatic relations between Spain and the United States were greatly strained. Cuba had risen in rebellion against Spain, and owing to the conduct of the war there were many sympathisers in the United States for the Insurgents.

The United States war vessel "Maine" was in Havana Harbour at this time. Unfortunately on February 15th about 9 h. 30 m. p.m. the "Maine" blew up. The explosion occurred in the magazine and 255 men were killed.

This event caused the feeling between United States and Spain to become embittered, and war followed in April.

Now, after nineteen years it can be proved that Spain did not murder the crew of that ship lying in one of her ports, nor destroy a ship belonging to a Nation with whom Spain was still friendly.

Up to the present time the cause of this explosion has never been discovered. Haydn's Dictionary of dates says "Cause absolutely unknown."

The wreck of the "Maine" was raised some time ago, but beyond concluding that the explosion occurred in the magazine used for storage of gun cotton nothing further could be learned.

This Solectric theory however, definitely asserts that the magazine was blown up by natural causes, which acted on the ammunition at 9 h. 16 m. p.m. on 15th February, and continued to do so until the explosion took place.

Solectric force passes through all materials and though there is no such thing as an absolute non-conductor, air and dry gasses are nearly absolute non-conductors.

Consequently, when Solectric force passes through an iron ship and invades the magazine department, heat is evolved wherever there are substances or gases which set up resistance, and are non-conducting. Electricity might possibly pass over the outside of explosive shells from one to another and do no harm.

Solectric force of high potential passing from the heavens or through the earth would ignore the behaviour of metal or gas. It would pervade and fill the threatened locality with a force turning to heat and incandescent vapour. It would force gases into the open and ignite or detonate the explosive elements.

We see similar results during earthquakes when various coloured flames mount skyward or flash to and fro over the startled earth ; or when the imprisoned gases burst forth from the volcano and with incandescent fury kill every living thing.

Coal mines also illustrate this Solelectric action as we have seen in the last chapter. Hydrogen gas is forced out into the open roads of the mine and then becomes explosive by admixture with ordinary air. Solelectric force then fires it or ignites the coal dust floating in a badly ventilated pit.

Fortunately, when Nature intends to descend to violence she issues warnings ; and in the case of the " Maine " the first warning was on February 11th 12 h. 26 m. G.M.T.

At that time the sun and Venus were in conjunction, having the moon at $57\frac{1}{2}^{\circ}$ distant, a serious warning as will be understood by reference to the diagram.

A second warning was issued on February 15 d. 6 h. 58 m., when the moon was at extreme declination. The moon is assisted by two planets.

Usually the hint conveyed at extreme declination time is the first warning ; in this case it is the second.

Diagram will show the distribution of Solelectric forces about 14 minutes before the explosion. The sun and Venus are acting directly on the doomed vessel, and are assisted by two powerful planets Jupiter and Saturn.

Nothing could have saved that ship but a quick departure some days before and a run of 100 miles.

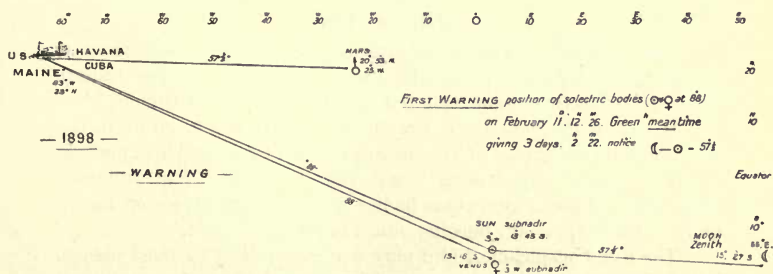


FIG. 95.

Probably this was a fact, and it would be interesting to know what explosives, if any, were on board of other war ships in the harbour, which did not take fire.

I consider this inquiry as very important, for our own efficient Navy is not free from these extraordinary disasters, so I give explanatory diagrams which illustrate two warnings, and the detonating combination.

This case of the "Jena" allows of no doubt as to the cause which brought about the explosion. It was Solectrically normal.

On March 8th 16 h. 26 m. G.M.T. the moon was lingering on extreme declination, and four Solectric bodies were, at 88° , charging Toulon with positive force. This was the first warning, Fig. 98.

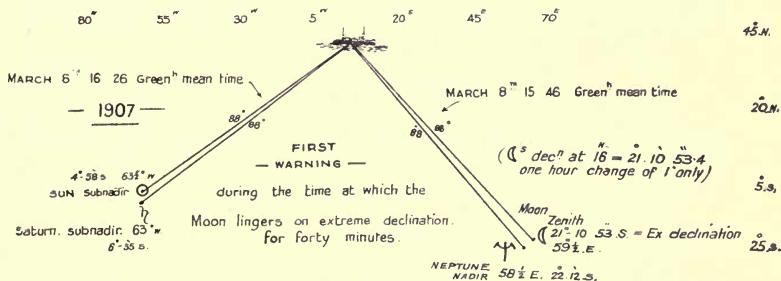


FIG. 98.

Two days eight hours before the explosion when the sun and moon are $57\frac{1}{2}^\circ$ apart a second warning is issued by the Solectric bureau, see diagram Fig. 99. At this time all war vessels having

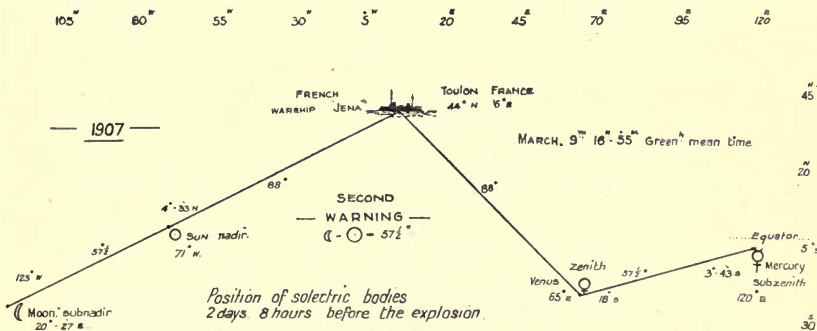


FIG. 99.

quantities of doubtful ammunition on board, should have been ordered to at once change their latitude by 100 miles.

The "Jena" blew up at 1 h. 35 m. p.m. French time and the diagram shows that three planets and the sun are acting on the ships in Toulon harbour, at that very minute, Fig. 100.

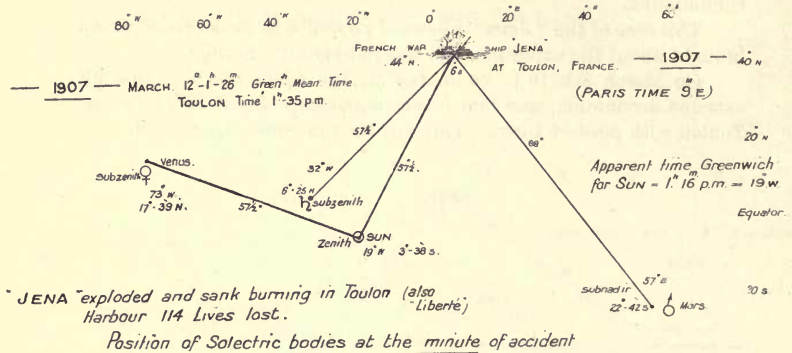


FIG. 100.

Can all this be mere coincidence? Can these awful accidents happen without some outside stimulating agency? And are they more wonderful than the appearance of a certain country during winter and summer?

The sun departs and the land covers itself with a soft white mantle; the sun returns and the same country clothes itself in gorgeous greens.

We have been taught to think Imperially, we must also learn to think Solecetrically.

THE BULWARK, 1914.

More recent catastrophes will now engage the reader's attention, and are worthy of serious consideration by all who have the welfare of our splendid Navy at heart.

H.M.S. "Bulwark" was lying at Sheerness on the morning of November 26th, 1914. Work was proceeding as usual when at 7 h. 52 m. a great explosion took place and the "Bulwark" existed no more. Seven hundred trained men for the great war were killed instantly, and England lost in two minutes a huge battleship, and was plunged in grief at the loss of a valuable crew of 700 men.

An inquest was held which returned a verdict of "Accident, cause unknown."

I am not aware whether the Naval authorities have come to any other conclusion, but the event is too serious to cover with silence.

I have no hesitation in asserting that H.M.S. "Bulwark" was blown up owing to certain sensitive explosives having been subjected to powerful soelectric action.

Diagram No. 103, November 25 d. 19 h. 52 m., shows four planets assisting the sun, the force passing from Jupiter. This combination takes only ten minutes to effect the extinction of the "Bulwark" and all the battleships latent power.

The usual warning was given, diagram 101, when the moon was

1914

1ST WARNING when ☾ at extreme Declination .. November 19th 4^h 56^m Greenwich m. time.

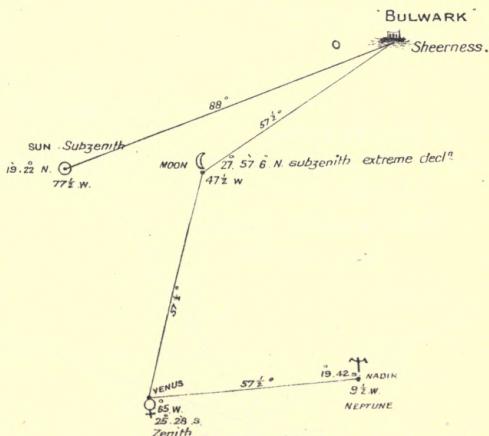


FIG. 101.

on extreme declination on November 19 d. 4 h. 56 m. G.M.T. ; and a second warning was issued when sun and moon were 57½° apart, which so often happens, November 21 d. 2 h. 4 m., diagram 102.

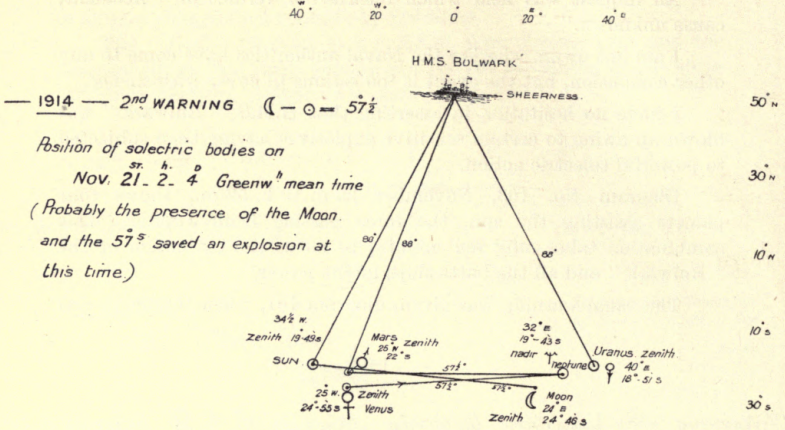


FIG. 102.

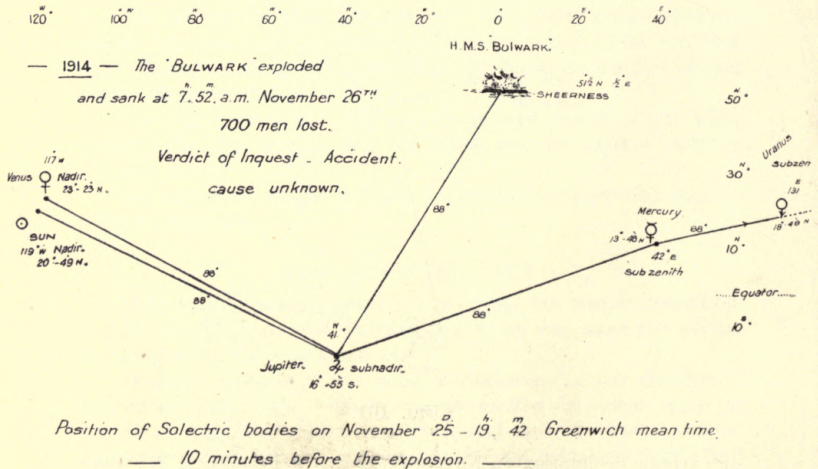


FIG. 103.

These diagrams are given because they strengthen the contention that the accident under discussion was caused by solectric agency.

"PRINCESS IRENE," 1915.

Just six months after the last deplorable loss another vessel, a naval transport of 6,000 tons was blown up at Sheerness, the place which also saw the last of the "Bulwark."

On May 26th, 23 h. 12 m. G.M.T., the "Princess Irene" was blown into small pieces by a violent explosion. An observer stated that the flames were two miles high. Three hundred and fifty lives were lost. Ten days and a-half previously an urgent warning was written in the heavens. The sun was $57\frac{1}{2}^\circ$ from the moon at the time of her greatest declination, $27^\circ 31' 19.5''$ N., see diagram 104, May 16 d. 7 h. 28 m.

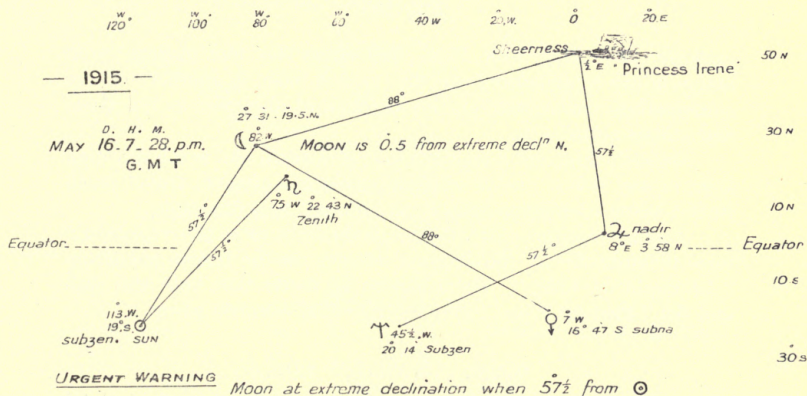
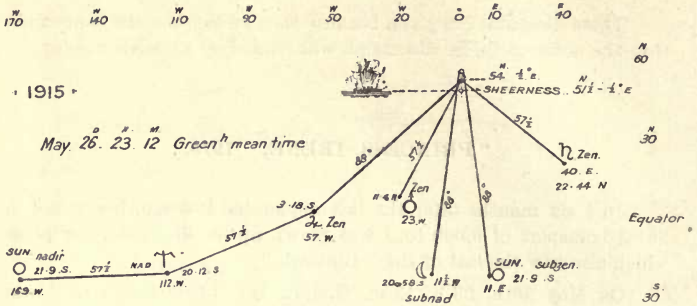


FIG. 104.

Thus two usual warnings were included in one, and are doubly serious. These warnings give definite assurance that solectric action is taking place.

The second diagram, No. 105, is calculated for the minute of



The Princess Irene Naval transport of 6000 tons was blown up at Sheerness. at 11 12 a.m. May. 27th — Ship was utterly destroyed, with a loss of 350 Lives. The solelectric force at the Minute of explosion is concentrated Northward of the Ship and on same meridian.

FIG. 105.

explosion, May 26 d. 23 h. 12 m., and shows that four planets are in action in one combination, and the sun and moon in another. These combinations concentrate on the meridian of Sheerness at this time, and a little north of it.

Solelectric force has a greater range in a north and south direction than in any other. Even solelectric messages (wireless) travel much further along a meridian than in an east and west direction.

Another example of travel on a meridian by an explosive solelectric force is illustrated by the diagram referring to the Italian battleship "Leonardo da Vinci." There can be no doubt that both this ship and the "Princess Irene" were destroyed by solelectric power.

H.M.S. "NATAL," 1915.

On the last day of the year 1915 the country was shocked by reading in the morning paper, the Secretary of the Admiralty makes the following announcement:—

"H.M.S. 'Natal,' armoured cruiser, sank yesterday afternoon while in harbour, as the result of an internal explosion.

About 300 men were killed."

The Press headline is "Third Explosion Mystery."

It seemed to me an urgent matter to discover the cause of this unfortunate occurrence.

If the solectric theory could explain the causes it would be a relief, because the idea of treachery in our midst begets nervous anxiety and a desire for cruel reprisal.

The problem was not easy because the position of the ship was not published and was unknown to me. A British war vessel may have been in any harbour in the world at the time of accident.

Secondly, the time was not stated, although a valuable hint was conveyed in the word "afternoon."

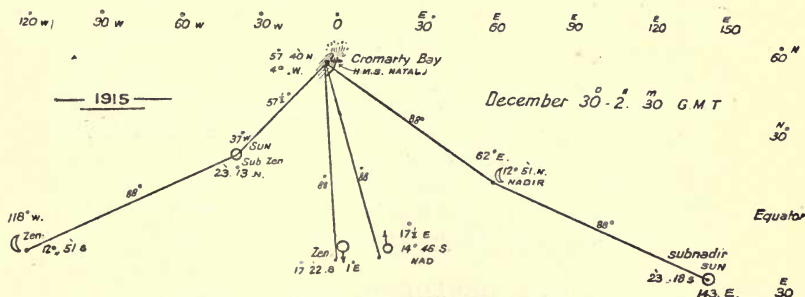
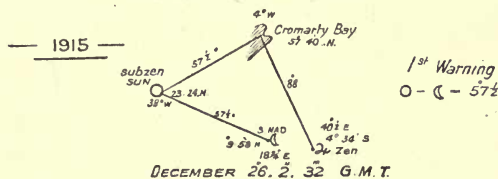
After two days struggle I was able to draw out diagrams which placed the "Natal" in Cromarty Bay when the explosion took place, and the time as 2 h. 32 m. G.M.T.

This case is rather exceptional as the moon is a principal agent, and usually the moon is absent in explosion arrangements.

Nor does the moon give any intimation at extreme declination period, probably because in the meantime she crosses the Equator.

But on December 26 d. 2 h. 32 m. we gather a warning when sun and moon are $57\frac{1}{2}^\circ$ apart—diagram 106.

LOSS of H.M.S. NATAL



Solectric position at computed time and place of Ships loss with 300 men.

Sun and Moon are taken from their opposite positions.

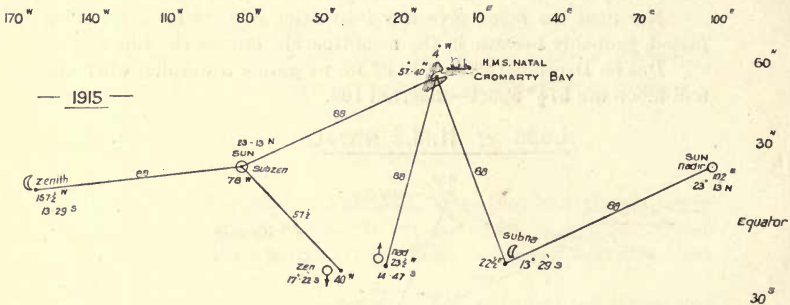
FIGS. 106 & 107.

On the same day there is another warning at 5 h. 12 m. p.m. in which Saturn takes a place.

On December 30th, 2 h. 30 m. G.M.T., diagram 107, a combination falls over Cromarty Bay powerful enough to set fire to any explosive which from some cause has deteriorated, or become inferior and given off gases of low flash nature.

On the same day at 5 h. 14 m. G.M.T. another combination competent to cause the explosion passed over Cromarty Bay.

I am unable to distinguish which of them was in action when the ship blew up, probably the latter one, and information as to the time and place of this accident is refused, owing no doubt to military considerations. See diagram 108 for December 30th, 5.14 p.m.



Explosion and loss of H.M.S. NATAL, and 300 men

December 30^d 5^h 14^m GMT — Second possible time of explosion.
(by calculation)

FIG. 108.

Two days after the event, however, I forwarded the result of my calculations to the proper authority, and I stated that if the "Natal" was wrecked in Cromarty Bay, and near the hour mentioned, that ship was lost through natural causes.

And there the matter remains.

My opinion also remains that we must look to our powder, and that Cromarty Bay was the scene of this disaster.

"THE BENEDETTO BRIN," 1915.

The following telegrams from Italy, taken from the London "Chronicle" of September 30th, 1915, will inform the reader in regard to this case. The day and hour of the awful misfortune are

not given, but as the place is mentioned the calculation of the time was simplified.

In fact, I soon was able to write to Brindisi giving the exact time by calculation and asking for the correct hour of occurrence.

Nearly three months elapsed before a censored reply came to say that my calculated time was within eight minutes of the time by observation.

One is tempted to think that the local clocks were incorrect by that amount.

ITALIAN BATTLESHIP BLOWN UP.

424 MEN MISSING: ADMIRAL KILLED.

FIRE FOLLOWS EXPLOSION OF AMMUNITION.

ROME,

September 29th, 1915.

An official communique from the Admiralty states that through some cause not at present ascertained an explosion occurred in the ammunition stores of the Italian battleship "Benedetto Brin," while she was lying in the Port of Brindisi.

A fire followed upon the explosion.

There is no question of any foreign agent being concerned in the disaster.

So far eight officers and 379 men have been saved. Among the officers who have lost their lives is Rear-Admiral Rubin del Cervin.—Central News.

TURIN,

September 29th, 1915.

Grievous as is the disaster to the "Benedetto Brin" whilst anchored in Brindisi roadstead, the sorrow of the Italian people is mainly concerned with the deplorable loss of the very able and popular Rear-Admiral Rubin del Cervin and the officers and men who perished.

The ship itself was constructed eleven years ago, so that its fate in no wise impairs the vital fighting value of the Italian Navy. Torpedoing at the hands of the enemy is altogether excluded, and the cause of the fatal explosion is generally attributed to spontaneous combustion in the powder magazines, such as cost the French the loss of the battleships "Jena" and "Liberte" in Toulon Harbour.

The Prime Minister, Signor Salandra, who is also acting Minister of Marine pending the imminent appointment of a successor to the invalid Admiral Viale, recently resigned, has superseded the ordinary Commission of Inquiry, and has charged the Duke of the Abruzzi

commanding the naval forces, to conduct a severe investigation without respect for persons should negligence or graver guilt result.

Exchange Rome message says the press openly alleges foul play in commenting on blowing up of the "Benedetto Brin."

On September 23 d. 15 h. 47 m. a warning was given to Brindisi, four days before the event (Diagram 109).

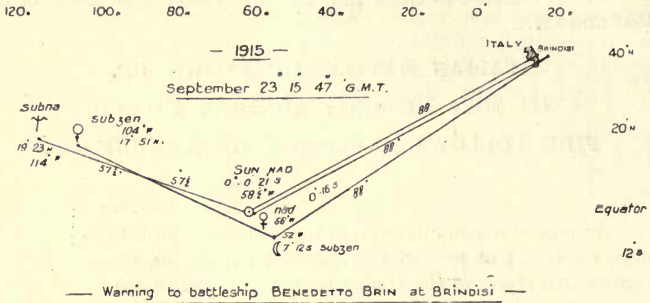
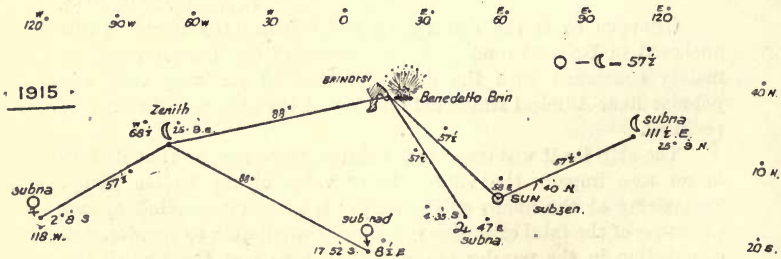


FIG. 109.

The sun was then half a mile from the Equator in 59° W., and the moon was in 52° W. and $7^{\circ} 20'$ N. At 88° from sun's nadir and the moon's sub-Zenith positions the circles crossed over Brindisi.

Diagram 110 shows the Soletric position on September 27 d.



Soletric position 6 minutes before the explosion September 27 20. 0. G.M.T.
Loss of the Italian Battleship BENEDETTO BRIN and 400 men

FIG. 110.

20 h. 0 m. G.M.T. six minutes before the explosion took place, and this evidence clearly proves that the accident was due to natural causes.

It may be observed also that in this example the day had to be calculated, which was successfully done.

LOSS OF H.M.S. HAMPSHIRE, 1916, OFF ORKNEY ISLANDS.

This tragic wreck happened on the 5th June, 1916. All hands were lost except 12, and among them was Lord Kitchener and Staff, on a voyage to Russia.

A deep and sincere grief at once pervaded the whole country, for Lord Kitchener held a unique position in the hearts of his countrymen.

No one is satisfied that the true cause of the Nation's sad loss has been discovered.

But I know the truth of it, and it is set down here. No one can contest it, because it is the result of mathematical reasoning. It is a typical case, a Solectric certainty.

There comes the first intimation on June 1st 6 h. G.M.T. when the moon is at extreme declination N. This Diagram (111) shows

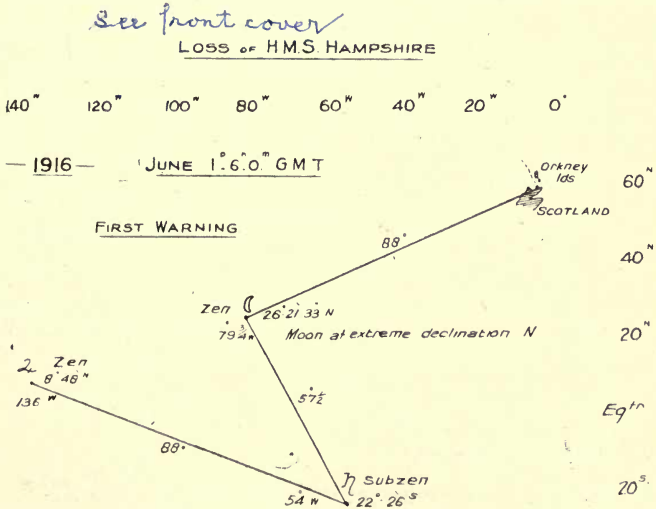
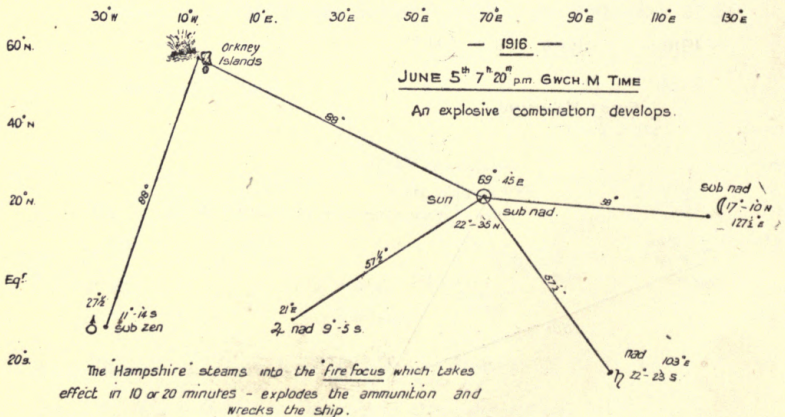
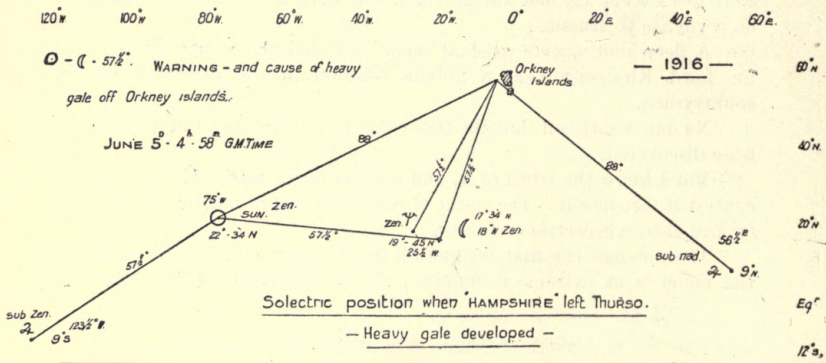


FIG. 111.

a threatening ray which describes an arc at 88° over the west coast of Orkney Islands.

Had there been in this country a Solectric College in place of a Meteorological Society who think that all knowledge can be derived from a column of mercury, the experts would have noted the hint and at once sought for a second warning which would give more definite information.



FIGS. 112 & 113,

And these collegians would have found the time when sun and moon would be $57\frac{1}{2}^{\circ}$ apart.

From further calculation the Diagram (112) would develop, and those men familiar with Solectrics would say at once that on June 5th 4 h. 58 m. G.M.T. a heavy gale would culminate on Orkney's west coast; also that it would be very cold with a high sea, because positive force was rushing from the sun.

Moreover, these solectric professors would have stopped the sailing of the "Hampshire" for a day. Alas, at that very worst hour, 5 h. p.m., the doomed ship sailed from Thurso.

Nor is this all, for in about two and a-half hours afterwards the sun formed an explosive combination with three planets, and there is a fire focus off the Orkney coast now, into which H.M.S. "Hampshire" and all her fine men steam to destruction.

It was possible to have foreseen and avoided this danger. This is not very comforting, but there is a grain of satisfaction in the thought that the enemy did *not* do this, and when he claimed the credit of sinking the ship he, as usual, was speaking falsely.

Three Diagrams (111, 112, 113) will show the exact Solectric conditions at the times stated.

The telegrams from the north gave various hours for the time of accident, probably owing to summer regulation.

I therefore disregarded them and worked steadily along on an astronomical basis to find the result correct.

These details are to demonstrate that the Solectric theory rests on a solid mathematical foundation, and it is hoped they will not weary the reader.

KITCHENER'S FATE.

(Paper of 10/6/16.)

"BOAT WENT TO PIECES ON THE ROCKS."

DEAD MEN'S SCARS TELLING OF HOPELESS CLIFF CLIMB.

TORPEDO THEORY REJECTED: MINE OR HIDDEN REEF.

10th June, 1916.

Gradually the facts; or some of the facts, relating to the tragedy of the "Hampshire" are coming to light, and it is hoped that the Admiralty may in time find itself in a position to issue an authoritative statement,

Telegraphing last night from the north coast of Scotland the special correspondent of the "Manchester Guardian" says :—

To-day I met an officer on a cargo steamer who, without any theories, told me of his own experience and the news which he had heard in an Orkney cruise. He passed the scene of the disaster a few hours after it happened.

It was marked by a great patch of oil on the waves and by the activity of the patrol boats. It was near Skaill Bay, on the western side of the Orkneys, between Marwick Head and the Brough of Birsay, and as near as he could reckon it would be about a mile and a-half from land.

Lord Kitchener and his staff arrived at Thurso, the northernmost port of the mainland, on Monday, and embarked on the "Hampshire" 5/6/16.

According to my informant, a patrol boat near Marwick Head gave the first alarm, about a quarter to nine on Monday night.

The alarm was that a warship was on fire in Skaill Bay, and all the Navy boats round about hastened to give succour. Quick as they were, it was unavailing. The "Hampshire" sank in 20 minutes, and except for floating wreckage and blobs of oil on the ocean not a trace was left.

Some of the men had been picked up in full warmth, and they bore scars of a terrible and hopeless climb up the cruel cliffs of Orkney, where the rocks rise sheer out of the sea for hundreds of feet. Some of the cliffs are nine times higher than the dome of St. Paul's, *i.e.*, 4,500 feet

The tale in the islands was that Lord Kitchener and his staff had left the ship in one of the boats which had been lost, and that in a stormy sea it had gone to pieces against the rocks.

TORPEDO THEORY REJECTED.

My informant and several other people who had actual experience of the weather round Orkney on Monday and Tuesday emphatically reject the idea that the "Hampshire" was sunk by a torpedo from a German submarine.

German submarines have visited these parts, but the general testimony is that unless one is to assume a miracle of luck it would have been impossible to launch a torpedo with any chance of striking in such a high sea.

Among seafarers there is also much scepticism about the mine theory, though this scepticism is not so well warranted.

I have it on the authority of those who have encountered them

that loose mines, washed from their moorings by rough weather, have occasionally been seen near the west coast of Orkney.

This seems the most probable explanation, though many of the trawlers who speak by intimate experience of the coast still favour the idea that the destruction of the "Hampshire" was a simple case of shipwreck on the northern reef—a hidden but notorious peril.

ADMIRALTY ACCOUNT.

ADMIRALTY, Thursday, 8.50 p.m., 15/6/16.

From the report of the inquiry into the loss of the "Hampshire," at which the twelve survivors from that ship were all examined, the following are the conclusions arrived at concerning the circumstances of the disaster :—

The "Hampshire" was proceeding along the west coast of the Orkneys; a heavy gale was blowing with the seas breaking over the ship, which necessitated her being partially battened down. Between 7.30 and 7.45 p.m. the vessel struck a mine and began at once to settle by the bows, heeling over to starboard before she finally went down about fifteen minutes after.

Orders were given by the captain for all hands to go to their established stations for abandoning ship. Some of the hatches were opened and the ship's company went quickly to their stations. Efforts were made without success to lower some of the boats, one of them being broken in half during the process and her occupants thrown into the water.

As the men were moving up one of the hatchways to their stations Lord Kitchener, accompanied by a naval officer, appeared. The latter called out "Make way for Lord Kitchener," and they both went up on to the quarter-deck, and subsequently four military officers were seen on the quarter-deck walking aft on the port side.

The captain called out for Lord Kitchener to come up to the fore bridge near where the captain's boat was hoisted, he was also heard calling for Lord Kitchener to get into the boat, but no one is able to say whether Lord Kitchener got into the boat or not, nor what occurred to this boat; nor did anyone see any of the boats get clear of the ship.

Large numbers of the crew used their life-saving belts, waist-coats, etc., which appear to have proved effective in keeping them afloat. Three rafts were safely launched, and with about 50 to 70 men on each of them got clear of the ship. A private soldier appears to have left the ship on one of the rafts, but it is not known what became of him.

It was light up to about 11 p.m.

Though the rafts with these large numbers of men got safely away, in one case out of over 70 men on board 6 only survived. The survivors all report that men gradually dropped off, and even died on board the rafts from exhaustion, exposure and cold. Some of the crew must have perished trying to land on the rocky coast after such long exposure, and some died after landing.

In forwarding this report of the inquiry, the Commander-in-Chief of the Grand Fleet says :—

“I cannot adequately express the sorrow felt by me personally and by the officers and men of the Grand Fleet generally at the fact that so distinguished a soldier and so great a man should have lost his life while under the care of the Fleet.”

Before a week had past I forwarded to the proper authorities a diagram showing the causes of the “Hampshire’s” loss, and it is comforting to know that our Fleet was in no wise to blame for that regrettable event.

I hope some day (perhaps before I am myself called to rest) that some able official, impervious to gibes, may by means of this theory save many gallant men from a violent death.

The “Daily Mail” of September 12th, 1916, publishes the following :—

ITALIAN NAVAL DISASTER.

AUGUST 2ND, 1916.

DREADNOUGHT BLOWN UP IN HARBOUR.

248 LIVES LOST.

More than a month ago an Italian Dreadnought met a fate similar to that of the Benedetto Brin, and in our own Navy of the Bulwark, Natal, and Princess Irene, being blown up in harbour, but the story has only just been published.

The ship in question was the “Leonardo da Vinci,” of 23,340 tons displacement. She was one of the six finest ships possessed by Italy at the beginning of the war. She was armed with thirteen 12 in. guns, eighteen 4·7 in. guns, twenty lighter guns, and three submerged torpedo tubes, and she had a speed of 23 knots.

Of 1,190 men on board, 248 lost their lives on August 2nd 1916.

CAPTAIN'S HEROISM.

FATAL BURNS RECEIVED IN FIGHTING FLAMES.

ROME, 11/9/16.

The following official details with regard to the fire and subsequent explosion on board the Italian Dreadnought "Leonardo da Vinci," which resulted in the sinking of the vessel on August 2nd, 1916, are now for the first time published.

"The warship was moored in a position sheltering her from any possibility of any hostile attack on the part of the enemy. A fire broke out near the aft magazine. The prompt action, which was worthy of all praise, of the officer on duty secured the immediate flooding of the magazine and prevented the complete destruction of the ship.

SUNK IN 36 FT. OF WATER.

"As the result, however, of a subsequent explosion the hull sustained damage and there was an inrush of water. The ship settled on the bottom at a depth of $11\frac{1}{2}$ metres (about 36 ft.). Effective measures for the rescue of the crew succeeded in saving many of those on board. Out of 34 officers and 1,156 men composing the crew 21 officers and 227 men fell victims to their duty.

"The immediate and searching inquiry which was held into the mishap, and which was necessarily conducted in complete secrecy, led to the conclusion that all idea of hostile action from outside or of any defect in the explosives used in the Navy was to be excluded."

AT TARANTO.

The Milan correspondent of the "Daily Telegraph" says:—

It was on the night of August 2nd, 1916, when a sudden blaze of fire illuminated the harbour of Taranto, and sent a glare over the town, causing great consternation.

The general alarm was rung, and word went round that the battleship "Leonardo da Vinci" was burning. Great lurid flames leaped out of her stern.

Explosions followed at intervals, which hurled guns and parts of the ship in the air, and the men on board could be seen fighting like heroes to master the flames and save the magnificent ship.

FIRE AMONG AMMUNITION.

The fire broke out first near the upper deck amidships, where shells had been placed, intended to be used for gun practice on the following morning. Some of these shells exploded, causing the first damage. Gradually there were other explosions,

Officers and men, at the risk of their lives, stood by, employing every available means to avoid further disaster.

The captain and his second in command both died from burns and wounds. The former, after being hurled overboard, was saved by a boat, but had himself hoisted back aboard again, and died later in hospital after suffering agonies from burns.

All night his other officers and numerous men displayed similar extraordinary heroism, but all in vain. It was then decided in the last extremity to open the valves and sink the ship before the fire could reach the magazines.

She sank rapidly after this, and forty-five minutes after the fire began she had disappeared with the exception of the funnels and turrets, which still emerged above the water.

NOT SPONTANEOUS COMBUSTION.

According to some reports a preliminary inquiry attributes the cause to naphtha taking fire, but a special commission will now make an exhaustive investigation. One thing has been thoroughly established, and that is that the explosion was not caused by any spontaneous combustion of powder or shells.

Disaster is a word which well describes this event. It means some sudden calamity brought about by evil influence of the stars. There were many unexplained phenomena in old times and the astrologers blamed the stars for many of them. The Italian word "disastro" an evil chance, shows up the trend of thought in those days in reference to unexplained evil. It was mere imagination perhaps, and yet there is truth in it.

The first diagram 114, July 25 d. 16 h. 38 m. shows a strong warning to Taranto, when at the moon's extreme declination period there are two threatening combinations overhanging the district and harbour.

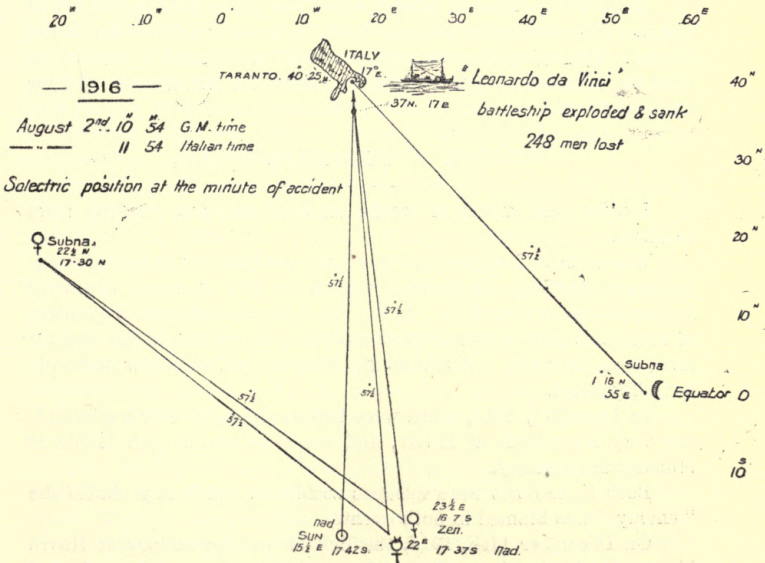
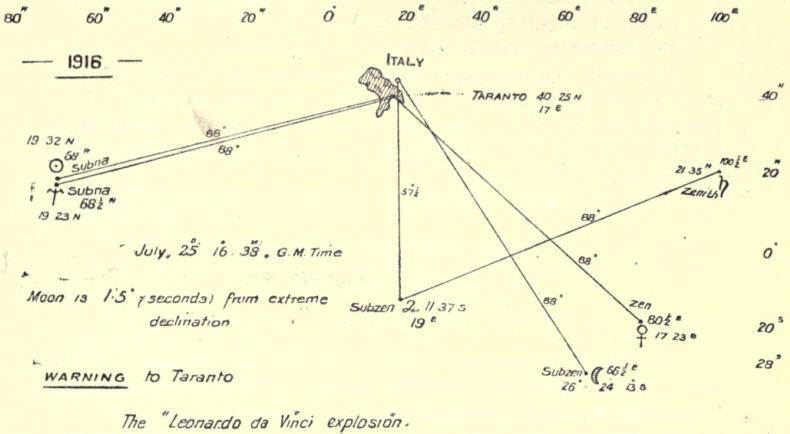
The second diagram 115, August 2 d. 10 h. 54 m. shows how at the very minute of the event the sun and three planets cross with the moon on Taranto harbour itself. The sun's combination concentrates on the meridian of Taranto in a manner similar to that which happened in the case of "Princess Irene."

After searching inquiry all idea of hostile action from outside, or of spontaneous combustion is to be excluded, says the report.

The same verdict results after every inquiry into the now numerous explosions on battleships.

The position is therefore as follows :—

(1) It is agreed that no enemy action from outside caused the explosion.



FIGS. 114 & 115.

(2) Authorities also agree that the ammunition did not explode through spontaneous combustion.

But some cause must exist for these explosions.

Evidently the various Admiralties incline to the opinion that some inside treachery is the cause of these dire accidents. This possibly may be true in some cases, but those examples included in this book and for which diagrams have been drawn out are I am sure, the effects of natural causes.

The "Daily Mail" of October 17th, 1916, prints the following :—

£4,000 ITALIAN REWARD.

October 16th, 1916.

ROME.

Monday.

The Italian Government is offering £4,000 for information which will fix the responsibility for the blowing up of the Dreadnought, "Leonardo da Vinci." (Exchange.)

It would indeed be pleasant to execute some spy or traitor guilty of this terrible outrage.

But if my contention is true, *and it is true*, we shall by the study and use of Solectrics be able to avoid such awful happenings in the future. The Italian Government may not feel disposed to present me with the Reward, so I must present them with this information for humanity's sake.

POWDER WORKS EXPLOSIONS.

Powder and munition works on land are not immune from accident.

When these factories are new and contain a number of inexperienced workers, there must always be risk of some necessary precaution being forgotten. It is remarkable that so great a quantity of munitions has been manufactured while thousands of the workers have been inexpert and new to the business yet only few accidents have happened.

In December, 1915, there were two alarming factory explosions, one very regrettable at Havre, and the other not so regrettable at Munster in Germany.

Both these cases were solectric accidents, and it is probable the "enemy" was blamed in both events.

On December 11th, 1915, the Belgian powder factory at Havre blew up, and below is an account from a daily newspaper in condensed form.

BELGIAN STATE WORKS BLOWN UP.

December 11th, 9.45 a.m.

(From Our Special Correspondent.)

PARIS,

December, 12th, 1915 (delayed)

Over 100 people were killed, and about 1,000 injured by a great explosion yesterday morning at the Belgian Government's powder works at Gravelle Ste. Honorine, two miles from Havre. The effects of the explosion were felt 25 miles away. Havre itself was shaken as if by an earthquake. Traffic stopped; panics occurred in some of the schools and children were crushed to death.

The explosion occurred in an annexe of the factory. The most reliable estimates place the dead at 110.

WINDOWS BROKEN 25 MILES AWAY.

The Havre correspondent of the "Echo de Paris" sends a vivid description of the disaster. *It was a quarter to ten in the morning* when a frightful crash resounded through the town. The noise was heard for miles around, at Trouville and Fecamp and Yvetot. In Havre all traffic came to a standstill, and there was an immense sensation. Immediately after the explosion a thick column of smoke went up into the air. The works of the Belgian State powder works that occupy the huge premises of the Bundy factory on the Boulevard Sadi-Carnot had been partly destroyed. Many of the neighbouring factories had suffered great damage.

In the powder works 1,500 workpeople were employed, but only those in the immediate neighbourhood of the building where the explosion took place were killed. A large number of other people were injured, not merely in this factory, but throughout the district, by falling wreckage. The atmospheric shock caused by the explosion was felt for 30 miles around.

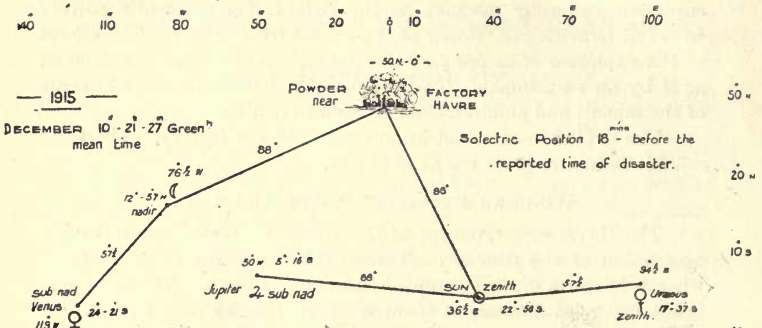
At Pont-Andemer, 25 miles distant, windows were broken. In the immediate neighbourhood it looked as if a cyclone had passed. Factories were shaken as if by an earthquake, and glass roofs tumbled in; brick walls collapsed, and the roofs of neighbouring houses were torn off.

The fire brigade from Havre was soon on the spot, and military assistance was sent. In Harfleur and the neighbouring townships whole streets of houses look as though they had been bombarded. Not a window remains. Whole sides of houses have fallen in. The stained-glass windows of the church at Harfleur and in many of the churches of Havre itself were smashed.

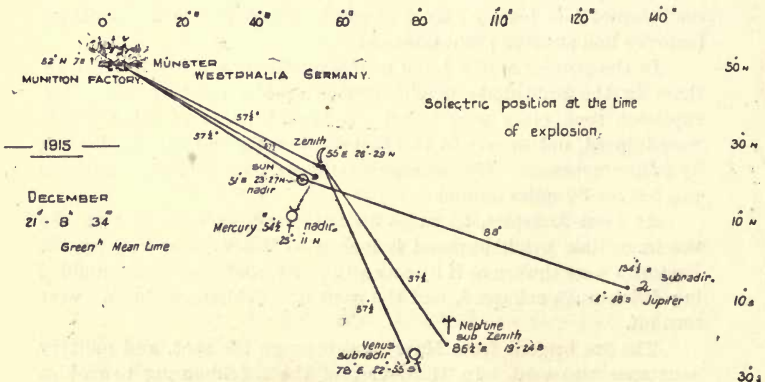
The "Temps" says: An inquiry has been made by the civil, military and naval authorities into the causes of the catastrophe.

Diagram 116, December 10 d. 21 h. 27 m., shows the soelectric condition 18 minutes before the reported time of disaster, and is quite strong enough to bring about the accident described.

Jupiter and Venus are the most dangerous planets when acting with the sun.



Account states that at 9.45 a.m. Dec^r 11th 1915 - the Belgian Government's Powder Works, two miles from Havre, blew up - 110 Men killed & 300 wounded.



Prussian Arms Factory blown up between 8^h and 11^h p.m. Dec^r 21st /15. 400 killed, hundreds wounded. Smoke from floor noticed before explosion.

FIGS. 116 & 117.

GERMAN MUNITION FACTORY, 1915.

The following account describes a similar but greater explosion than the last.

Munster is in Westphalia—52° N. and 7° E.

Jupiter and Venus again are conspicuous elements. Diagram 117, December 21 d. 8 h. 34 m., shows the situation a little before the first explosions—the others would follow as the factory was an ammunition depot.

BIG ARMS FACTORY BLOWN UP 52 N. 7 E.

PRUSSIAN STATE WORKS WRECKED.

AMSTERDAM,

December 22nd, 1915.

Arrivals from Osnabrueck (Hanover) at Oldenzaal (Holland), state that there were three explosions in the munitions factory (powder and ammunition depots), near Muenster (Westphalia), between 8 and 11 o'clock last night, 21/12/15.

Of 600 women employed there 300 are reported to have been killed. Enormous damage was done to the town and railway traffic is delayed. Nothing is known of the cause of the explosion.—Reuter.

The Central News report says that work at the Imperial factory was in full swing when the explosion occurred. This message gives the number of dead as 400, mostly women and children. The greater part of the factory and many adjacent buildings were wiped out of existence.

GREAT HAVOC OF MUENSTER SHELL EXPLOSIONS.

AMSTERDAM,

Tuesday, 28/12/15.

The Oldenzaal correspondent of the "Telegraaf" telegraphs further particulars of the explosions at an ammunition factory at Muenster, Westphalia. Before the explosions, of which there were several, occurred, various women remarked smoke in different sections, but little attention was paid to this, as it not infrequently happened.

A sergeant, who was making his round, observed smoke coming from the floor, and ordered the women to leave the factory. Shortly afterwards a violent explosion occurred, by which the sergeant and a large number of workmen in the factory lost their lives. About 750 people were in the factory.

Immediately after the explosion, men, women and children in the neighbourhood rushed into the street. Many thought it was an

air raid. This was the cause of many deaths, because the bombs and shells in the factory continued to explode. One shell flew into the air and fell in the street tearing a big hole. It damaged a great number of houses and killed several people.

The explosion was so violent that children were hurled into the air. A railway bridge was badly damaged. Among the exploding shells was a star shell of enormous illuminative power which lit up all Muenster. The number of victims must have been over 400.—Reuter.

Few who have had the patience to read this book so far can fail to believe the message contained in it.

Thirty years ago when I began to gather material for this work I knew there *was* a message to deliver, but what it was, came very slowly indeed. Often the problems seemed insoluble, but a flood of light always flowed round the edge of despair.

And so, I confess to a sad disregard of criticism ; I am prepared to be amused with,

Pooh ! Pooh ! Sir, it is not true Sir

Neither is it new, Sir, in fact

We always knew, Sir.

Thus a large number of critics are out of Court ; which reminds me of a Negro preacher I once heard, holding forth at Sierra Leone, from the top of a barrel.

“ Brederen, I’s here to give you a message from the Lard.

The Lard offers salvation to the black man ; He offers salvation free, tank the Lard for dem ting. Mind, I’s no so sure of the white man, so I wants no talk with him.’ (Cheers.)

I departed then, for it seemed to me that the preacher suspected I might produce arguments derived from the higher criticism.

But the arguments I have adduced here are based on the stars. How often does the anxious navigator seek advice from Arcturus or ask the way from Antares ? These stars and all of them have been tried friends to him through life ; they do not mean merely bright specks in a dark background. To the navigator their voice is soothing—Vox stellarum whispers sweet guidance to those who can hear.

And with the aid of his other friend the magnetic needle the seaman cuts his course in confidence through the pathless deep.

The most extraordinary of all gifts from Nature to man is that of the lodestone, a mineral that has but to be freely suspended and it will at all times indicate a direction from which all others may be at once deduced. Such an instrument was designed for an intelligent being ; it is of no utility even at this date to a gorilla.

It demonstrates a fore knowledge that man would require such aid in the future when the time came for the exchange of the products of one climate for the products of another. Migratory birds may be endowed with a faculty of being set in the direction of a north and south meridian when poised in the air, but centuries will elapse before man can acquire such a faculty. Most of us have felt a not altogether unpleasant sensation when descending in a very high swing, as if the Solectric components were rushing through us at too great a rate. Aviators will probably analyse these sensations in the future.

The magnetic needle is a great gratuitous gift, and it endows us with the faculty of direction at times when no amount of intelligent thought would be of the slightest avail.

What navigator, when the pitchy blackness of night has doubly fallen, when surrounded by menacing breakers flashing with peculiar light ; with land on both sides, and the shrieking squalls laden with hail stones, in blinding lightning and the noise of thunder muffled in the roar of the storm, what navigator has not looked for comfort into the dimly-lit birnacle at that mysterious magnetic needle. And, being off soundings having as it were, lost all touch with the earth and become the mere sport of the elements, weighted with anxiety and haggard with care, what wonder if a navigator can feel a friendly thrill from that tremulous needle, and look upon it as the finger of God—ever pointing the way of safety through the clashing of the sea.

Meteors and Other Phenomena.

In this chapter is given the solution of various problems of natural phenomena which have not hitherto been explained.

The investigation has been difficult owing to the scarcity of data and the insufficiency of detail.

During the early years of this inquiry I sought the key which would unlock the cave of Bolus, and lay open the secrets of the winds, and thus learn to know why the "wind bloweth where it listeth." To this end ample notes for many years were necessary and were obtained, and those notes have been sufficient. But I dreamed not that the key of the winds would prove to be a master key, a scientific "Open Sesame," and that in the same cave dwelt the volcano fiend, the earthquake fiend, and the explosion imp.

In fact to the bold explorer of the cave Nature's secrets in profusion are awaiting discovery. But each box of treasure requires careful unpacking, so that no nugget of knowledge may be left in the dust.

With this wealth of knowledge as it were open before me, I find myself unprepared to meet it. One must have notes and facts ready, to enable one to harmonise this new knowledge with actual experience.

But fortunately I have some data on which to proceed; enough in my judgment to prove the cases mentioned.

Among the infinite permutations possible to the nine Solectric elements and the sun, with which we have been working, there must be occasions when the terminals of two Solectric combinations approach each other so as to come within striking distance, but not near enough to concentrate on a definite area.

This is a familiar incident in electric work and is called a "short circuit." Fires are a common result of these short circuits.

When we imagine the enormous length of the Solectric circuit—stretching thousands of millions of miles—we can realise that a short Solectric circuit may be anything up to 1,000 miles.

This interval distance of a "Solectric short" depends upon the potential of the parts affected. The greater the voltage the further can an electric force pass through an insulating medium.

Meteors then are evidences of "sparking"; force is rushing through a non-conducting material from one powerful combination to another one at a distance.

Moreover, if a volume of Solectric force at very high potential forces itself through space or our atmosphere, it may meet various gases of the elements during the passage.

These surrounding gases in the path of the force between, say Jupiter and the earth, may be caught up and fused together, and thus changed into various metals.

The Solectric forces tend to become latent in solidity, and we see on a small scale the making of a world.

We know from experience in natural matters that excessive force is often absorbed by a change of condition ; if gases are subjected to extreme pressure they liquify ; if solids are heated sufficiently they change into gas.

Chambers says " Twenty-four of the terrestrial chemical elements have been found in aerolites, and no new element not found on earth has been found on them."

These bodies fall to earth and become part of it, sometimes as solid bodies weighing many tons, at other times they explode in the atmosphere and scatter fragments far and wide.

In the diagrams a meteor's track is often for convenience sake denoted by a zig-zag line ; this does not signify that the meteor adopts a zig-zag course.

MADRID METEORITE.

On the 10th February, 1896, a large meteorite exploded with a prodigious noise over Madrid.

Through the courtesy of the British Embassy, I was placed in communication with the director of the Meteorological Observatory at Madrid, and Dr. Francisco Inguez kindly sent me a pamphlet on the subject of " Los Bolidos," written by himself.

From that work I have gathered the details appertaining to this Madrid meteorite.

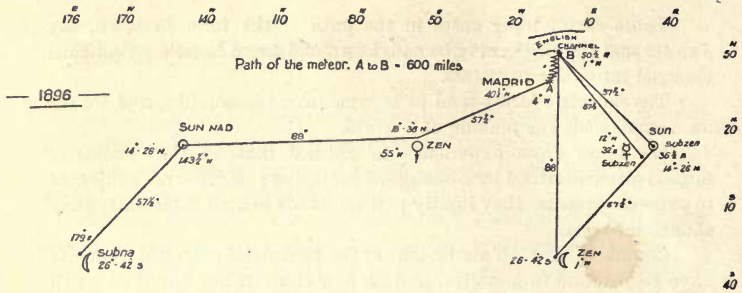
" El bolido presentaba el aspecto de un disco blanco, de diametro aparente proximately igual al del sol, y que se dirigia con rapidez de OSO a E.N.E. a las nueve y media," etc.

The meteor, which appeared as large as the sun, was of intense brillianee, and notwithstanding the splendour of the day, was seen by all.

It was the shape of a disc and travelling rapidly towards E.N.E., when at 9 h. 30 m. in the morning a dreadfully loud explosion occurred which shook buildings to their foundations and broke window panes.

This meteorite had evidently solidified but burst at a great heat near to Madrid.

Other meteorites were formed along the northward track A (Madrid) to B, the Solectric short circuit, as marked for convenience by the zig zag line in the accompanying diagram 118, February



THE MADRID METEORITE : about 9^h 30^m February 10th local time.
February 9^h 21^m 48^s Greenwich mean time.

FIG. 118.

10 d. 9.30 a.m. This track is 600 miles in length, and meteorites were reported at various places en route in the Spanish provinces of Navarra, Rioja and Huesca. Some force would probably be absorbed by the peaks of the Pyrenees; and a meteorite was seen near Bordeaux having crossed the mountains.

These meteors travelled correctly according to theory and some must have reached the English Channel, the other terminal (B) of the short circuit. The speed of these Solectric sparks has been estimated at from 20 to 80 miles per second, so that the whole journey from (A) to (B) could be accomplished in half a minute.

It will be noted that sun and moon are situated at $57\frac{1}{2}^\circ$ apart, a position which Solectrics teach is one developing a great potential.

METEOR OFF WOLF ROCK, 1910.

It is satisfactory to have evidence of the position of one end of the short circuit, such as a meteor gives us when falling into the sea, because it simplifies calculation.

From the London "Daily Chronicle" of 29th January, 1910, the following account is taken, and somewhat abbreviated.

"The steamship "Trafalgar" left Port Talbot, Wales, on January 26th, 1910, with coals for Bastia. Boisterous weather and heavy snowstorms were experienced after sailing.

"About 8 hours a.m. on the 28th the ship was 10 miles S.W. of the Wolf Rock when the ship trembled violently, and there was a loud

sharp report like the explosion of a cannon. The foremast seemed a mass of flame, and the whole ship became aglow. At that moment a large fiery body, with a tail about 30 or 40 ft. long struck the water some 20 ft. from the ship.

"Its appearance was accompanied by a loud hissing noise, and as it disappeared, a column of water rose in the air.

"Directly after this the men ran out of the forecandle saying it was on fire. The whole of the interior was glowing with a brilliant light; the engine room glowed with a violet light from which millions of sparks emanated.

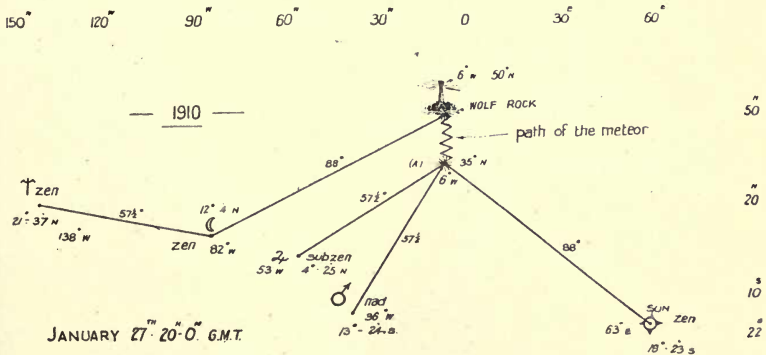
"The second mate received a violent shock from the sounding rod he was using. All the compasses became demagnetised, so the captain decided to put back to port. The "Lizard" was sighted with difficulty, and then, after following coasting vessels, the steamer found her way into Falmouth, amid blinding snowstorms.

"It was afterwards proved that the compasses acted rightly, and that the ship had been magnetised."

From the above account it is clear that the phenomenon described is electro-magnetic, or rather a Solelectric one. Any explanation of meteorites, must account for the accompaniments of brilliant light, sparks, explosions, and electric shocks.

To say that meteorites are simply matter revolving in the solar system and caught by the earth in its orbit is not a sufficient explanation.

The diagram 119, January 27 d. 20 h., illustrates the position of



Fall of a meteor near the steamer "Trafalgar" off Wolf Rock.

FIG. 119.

Solelectric bodies acting at the minute of occurrence, the zig zag line denoting the meteor's track from position (a) to Wolf Rock.

The next example is furnished by the Correspondent of the "Daily Mail" on October 3rd, 1910.

HUGE METEOR.

ONLY 150 MILES FROM THE EARTH.

(FROM OUR OWN CORRESPONDENT.)

JOHANNESBURG,

Monday.

Johannesburg was startled at 8.50 this *evening* by the largest shooting star or meteor ever seen in the district.

Its light was equal to that of a naval searchlight at fifty yards' range. The sky was illumined for three minutes, and the streets were as light as if it were day. Natives were terrified, believing that the end of the world was at hand.

The astronomical observers at the local observatory were nearly blinded. The director of the observatory estimated that the meteor was only 150 miles from the earth. The head of the meteor, he says, was pear-shaped and half the size of the moon in diameter. The tail was straight at first, but afterwards turned towards the south.

The diagram 120 for October 3 d. 6 h. 52 m. G.M.T. shows a solar

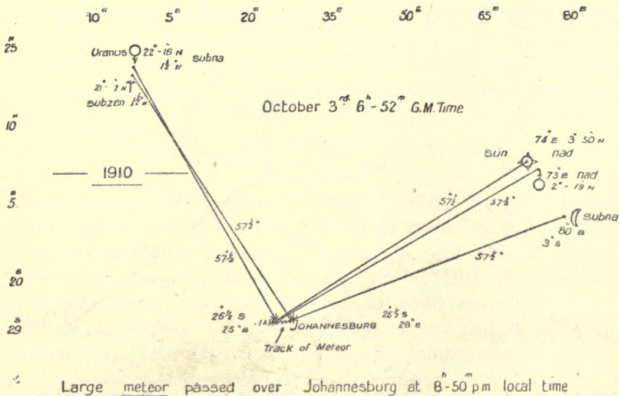


FIG. 120.

and a lunar combination west and east of Johannesburg.

The track works out as running on the parallel of $26\frac{1}{2}^{\circ}$ S. for 180 miles.

Three minutes seems to be an excessive estimate of the duration of the meteoric flash light. If a meteor took a long upward and downward course as well as a horizontal one, a minute would be possible, but three minutes duration is perhaps a mistake of observation.

HULL METEOR.

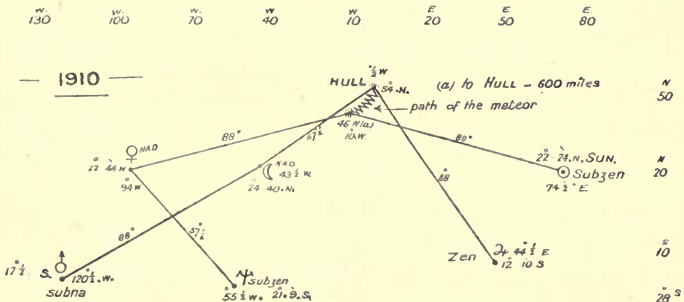
The following account refers to an incident which happened on the 6th December, 1910.

METEORITE'S HAVOC AT HULL.

Considerable damage to property was caused at Hull early yesterday morning by a meteorite which crashed through a building in the eastern quarter of the city and buried itself in the earth.

One stable was demolished, whilst the roofs of five others were shattered. There were eight horses in the stables, but all of them escaped injury, though they were discovered in a pitiable state of fright.

An eye-witness of the occurrence said that the meteorite looked like a ball with a tail of fire.



Explosion of a Meteor at Hull, 6^h 17^m a.m., December 6th
 December 5^h 18^m 17^s Greenwich mean time

FIG. 121. }

By the diagram we can see that the Solectric short circuit stretched out to a length of 8° , which is quite possible with Jupiter in one combination.

The time is stated as "early yesterday morning," and a search through various journals has not enabled me to give the time more accurately, from observation.

But by calculation the meteor fell at 6 h. 17 m. a.m. December 6th which seems to meet the case, and diagram 121, December 5 d. 18 h. 17 m. is made out for that time.

If any astronomer, or meteorologist (worthy of the name) can better explain this incident by their own scientific methods, it would be better done quickly.

Meteorologists especially must not expect the public to take them on trust much longer.

If they are unable by their own science; by centuries of barometer recording; by measuring rainfall, and by the continuous recording of atmospheric temperature; if they are unable to clearly explain the natural phenomena dealt with in this book, they must submit to be considered obsolete.

Meteorologists are already overwhelmed with useless records which they are unable to digest.

In fact there is little more to be gathered from observations which merely tell us for every minute the weight and temperature and moisture of the atmosphere.

In my opinion it is a reprehensible waste of public money to collect these minutiae of detail—leading nowhere. What we really lack are large facts and first principles, and these I am firmly convinced only Solectrics can supply.

We now come to a case which is a pleasure to investigate, because it is accurately described and all necessary data for calculation are given.

The letter from Captain Packham of steamship "Berbera" is annexed, taken from a London paper.

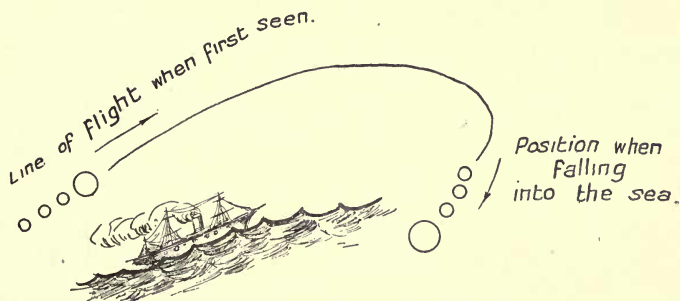
A REMARKABLE METEOR, 1911.

To the Editor of "The Standard."

SIR,—I would like to inform you and through you the public that at the following place and time a huge meteor lit up the heavens ; its path was from the Northern Crown towards the star Altair.

The head, which was an electric blue colour, appeared to be about half the diameter of the full moon ; in its tail were three starlike lights which were of a brilliant red colour.

When it had crossed ahead of the ship it seemed to pause, stop, and then turned right over and fell into the sea thus :—



Meteor seen by S.S. BERBERA. May 18th 1911.

A tail of three red lights

FIG. 122.

Mr. Combs, third officer on watch at the time, said it resembled a kite with three red lights in its tail.

The two native helmsmen both said their prayers and the man on the look-out was too paralysed for speech and could only gasp out, "Shaitan iga" (the devil's coming).

I am, Sir, your obedient servant,

F. W. PACKHAM,

Master.

Steamship "Berbera," May 18th, 1911.

Mediterranean Sea, latitude 33°, 24' N. ; longitude 26° 20'
E., at 11.40 p.m. apparent time at ship.

suddenly glowed for about a minute with an intense white light as strong as broad daylight.

This was followed four minutes later by the loud sound of a distant explosion, sudden gusts of wind and rumblings, the shaking of all houses, and by two slight earthquakes.

It is impossible to describe the terror of the population, who feared that a terrible earthquake convulsion would follow. The probable explanation is the fall of an immense meteor within the Messina- Catania district, but the exact locality is not yet known.

The sun in combination with Jupiter, Uranus and Neptune strikes the south end of Italy ; at that time the moon in combination with Mercury and Saturn is in touch with the west end of Sicily. The rush of force from Calabria to Sicily is greater than the land can carry conveniently, proved by the earthquakes and gusts of wind, so a short circuit is established and a mighty meteor rushes through the atmosphere.

Meteors are good evidence of the Solelectric forces surrounding us and passing through our own planet ; indeed our planet assists in the manufacture and distribution of the force. A meteor is a huge Solelectric spark.

After a few remarks by the way we shall proceed to examine further examples of strange phenomena.

I recollect on one occasion camping in the Chilian Cordillera de los Andes at a height of about 11,000 ft. The mules were unsaddled, rugs and equipment placed on the ground. It was a clear, cold, and fine afternoon, and the frozen particles of snow reflected the light in beautiful prismatic colours, as if the ground were strewn with diamond shavings.

Suddenly we felt ourselves lifted up bodily, the mules screamed with fright and got close to the ground, the latter example we two men quickly followed.

Then I heard a strange roar of wind ; the saddles and blankets and rugs and water horns sailed silently upwards into the air nearly 100 ft., and then quietly came down again, and resumed the exact spot each had started from.

Although the air moved, the lifting of the objects was not an effect of wind, and can only be described as Solelectric.

In high mountainous regions a familiar sight is the lightning, playing along the ridges ; at times sheets of blue fire course along the ground, and fire balls dance on the peaks.

Does this not show the earth to be in a condition of Solelectric activity.

The brig "Judith and Esther" was thrown on her beam ends during the passage of the centre of a cyclone, off east coast of Ceylon. The men were afflicted with blindness for some time and their finger nails turned black, remaining so for five weeks.

During a hurricane which passed over Barbados, W. Indies, cylinders of lightning are described as passing over the ground; meteors fell from aloft, spattering like quicksilver when striking the earth. Flaming blazes issued downwards and were returned by the earth upwards. A negro was in mortal fright, seeing great electric sparks passing from him.

Can it be contended that a storm is merely air in movement after such evidence? In this case there were meteors, fire and electric sparks to accompany wind, rain and lightning.

The present teaching is that wind is an effect of unequal atmospheric pressure, or it is an effect of temperature; that, for instance, a south wind is warm in England because it comes from the tropics. Yet places to the southward of England may, during that same time, experience a cold wind from the north, and consider it has come from the pole.

Wind is air in movement, but something is pushing it, and that something is Solelectric force, which has different characteristics in accordance with its positive or negative quality, and its direction of flow.

Earthquake and hurricane often happen together.

These incidents point to a common cause, which is Solelectric force.

Admiral Fitzroy mentions the following practice, which probably has now fallen into disuse.

At the Castle of Duino at Fiume, on the Adriatic, there was an old custom, for it is mentioned in a letter dated 1602, of warning the fishermen of the approach of stormy weather. On one of the bastions was fixed a pointed iron rod in an upright position.

In summer, when the weather had any appearance of being stormy, the soldier on guard examined or tested the iron rod by presenting to it the point of an iron halbert, and when he perceived the iron rod give out sparks, or show a small germ of flame at its point, he rang a bell to give notice to the country people working in the fields or to the fishermen at sea.

Fiume is situated on the seashore at the foot of the Julian Alps.

There would be rapid chargings and depletions of Solelectric force at such a place, which would give rise to sudden squalls, dangerous to fishing boats and small craft.

That the phenomena which have been discussed are caused by the sun is evident ; that they are principally electric is also clear.

We have called the action Solectric.

The only question remaining is as to whether the theory set out here is the correct Solectric theory.

It seems now to have received mathematical proof. Before any theory could be formed hundreds of cases had to be examined and calculated.

A few only of these examples have been given, but they will be considered sufficient to prove the case.

The very complexity of the subject is a warrant for the truth of the explanations, for one may try to reconcile numberless plans, and follow a thousand different paths, but failure awaits, if the truth is not in it.

The Solectric bodies must be at certain definite distances from each other ; they must be at certain definite distances from the affected area of disturbance, and the disturbance must happen at the particular time when all these necessary factors are in action, a few minutes of margin being at times allowed.

Anyone who implicitly believes in this theory, as does the writer, must be struck by the absence of chance, and the reign of designed law which pervades the whole solar system, that system which we have termed the Solectric system.

Evidently not a shower falls to the earth without the consent, as it were, of the whole Solectric family ; neither storm nor trouble shakes the planet without the moon and some kindred neighbour stretching out a relieving hand.

Our minds may be too small to understand what power designed these laws, but we can be sure they are not founded on folly, nor are they arranged with such care without purpose.

And it is comforting to man afloat in space on this planet earth to know that his thoughts, though infinitely small in comparison are of the same kind as those of the designer ; and that an understanding of the works must lead to an understanding of the worker.

Zophar, one of Job's comforters, reprovingly asked him, " Canst thou by searching find out God ? "

Science boldly replies to-day that searching is the only way.

We shall now see what explanation Solectrics can give of the remarkable experience which follows :—

The account is taken from the " Liverpool Evening Express," of April 11th, 1907.

OCEAN CHASM.

LIVERPOOL STEAMER'S PLUNGE.

The White Star liner "Teutonic," which arrived at Queenstown yesterday from New York, brought details of a wonderful sea story. Indeed, of all the extraordinary sea happenings that have ever found place in log books the one now detailed is the most remarkable. It is the story of an extraordinary experience that befell the crew of the Liverpool steamer "Planet Neptune," a steel screw steamer of 4,322 tons gross register, and belonging to the Leyland Shipping Co., Ltd., (Messrs. R. W. Leyland & Co., Manager), Liverpool.

The story, as detailed, is indeed remarkable. It is of a big and well laden British freighter, steaming quietly over a moonlit sea, suddenly pitching head foremost into a chasm which some subterranean convulsion seems to have opened in the ocean's bed. "It seemed," said Chief Officer Brown, who had just quitted the bridge at the time of the strange occurrence, "that a big section of the ocean's bed had suddenly caved in to some tremendous depth, and sunk so suddenly as to have caused a huge well-like depression on the ocean's surface. The bow of the ship plunged downward so suddenly that I thought she was going straight to the bottom."

It is estimated that it was between six and seven seconds before the dipping forefoot found the bottom of the pit. The vessel has about an 18-ft. freeboard forward, and when it is said that a mass of water, that was fully 15 ft. in height was "dished" over the bow as the vessel began recovering from her downward plunge, some idea of the depth of the chasm can be had.

Standing look-out on the forecastle head was a seaman named Shalberg. After he had recovered consciousness he said that when he felt the bow dropping from under him he instinctively crouched behind the breakwater and grasped a ringbolt. But the weight of 15 ft. of water rushing over his head was too much for his strength. He was found curled about an iron stanchion, the upper part of his body on one side of the stanchion, the lower limbs on the other. One leg was broken, a wrist dislocated, and the man otherwise so severely injured that he will be a cripple for life.

The "Planet Neptune" (continues the story) is from Monte Video, from which port she had sailed on *February 22nd*. She found the "hole" into which she pitched *four days after* leaving that port, and when she was about 200 miles off the southern coast of Brazil. The precise latitude and longitude could not be ascertained, but the log-

book showed that the vessel at noon that day, February 26th, 1907, was in latitude $29^{\circ} 46' S.$, longitude $47^{\circ} 8' W.$

The "Planet Neptune" of the Leyland Shipping Company, Ltd., did on this occasion, not only join with the real planet Neptune, but she took a historic part in a powerful combination of all the planets, including the earth, also the sun and moon.

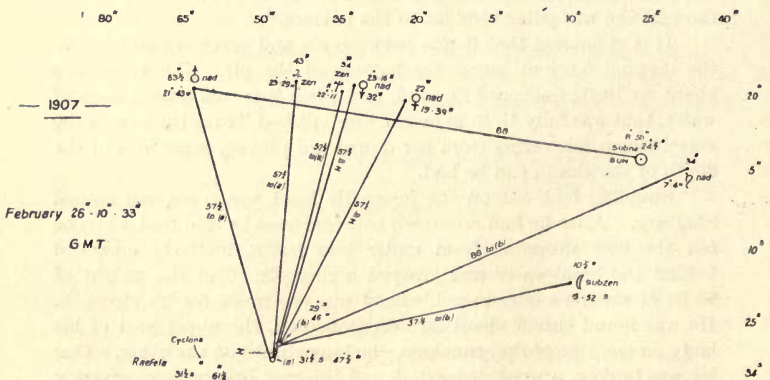
Indeed investigation shows that in nearly any other part of the world the "Planet Neptune" would have been lost during an earthquake or cyclone.

Hurricanes and earthquakes are very rare in the South Atlantic, from which we may presume that the land and water foundations are extremely good conductors.

Only in this way can the dangerous combinations which must inevitably fall over a large surface of this ocean be rendered harmless.

The forces which would be destructive elsewhere are borne away, dissipated and immediately passed along to other parts of the earth, to the moon and back to the sun or other friendly planet short of energy.

The accompanying diagram shows what calculation proves to be the fact.



Steamer in smooth water dives suddenly into deep chasm.
 (a) place of action of Sun's combination at time of occurrence.
 (b) position of ship and the chasm.

FIG. 125.

Every planet took a hand in this extraordinary game ; a condition of things which in another part of the world brought about the great Dharmasala earthquake (India) in April, 1905.

The following telegram shows that at the same time a cyclone raged 300 miles due west of the " Planet Neptune's " position. The cutting from the same newspaper is dated Buenos Ayres, February 27th, 1907.

DESTRUCTIVE CYCLONE IN ARGENTINA.

(Reuter's Telegram). 27/2/07.

Buenos Ayres, Wednesday. The Minister of the Interior has received a telegram from Rafaela, Province of Santa Fé, stating that a cyclone has destroyed the hospital, church and convent school as well as most of the houses there. The number of casualties is not yet known.

Rafaela is situated in about 32° S. and 62° W.

There might have been a commotion on the other side of the earth, Eastern Siberia, but I have no other record.

It is possible that a solelectric balance may be regained by the earth in a peaceful manner, if the earth be recharged at a suitable spot, such as the area passed over by " Planet Neptune " evidently is.

It is noteworthy that on February 19th, 20th and 21st, hurricanes, gales, and earthquake are reported. Jamaica cables a severe shock on the 21st ; Italy on the 21st reports storms and floods with enormous damage in all parts of the country.

A Liverpool paper before me dated February 21st, 1907, heads a column thus :—

Furious gale sweeps the country ; hurricane havoc, wind attains velocity of 100 miles an hour ; snow, floods and thunderstorm.

The cross channel steamer " Berlin " with 130 persons was lost at the Hook of Holland.

After such a general terrestrial upset as the above items suggest, our planet may have become short of negative Solelectric force and ready to absorb a vast quantity when offered.

We now return to the diagram 125 and calculation.

The ship " Planet Neptune " was in $29^{\circ} 46'$ S. and $47^{\circ} 8'$ W. at noon on the 26th February.

The diagram fixes the ship's position, and the time of occurrence at 7 h. 29 m. p.m. of that day. A cargo vessel, laden, but in smooth water the " Planet Neptune " would probably steam 10 knots per hour. An allowance of 74 miles on a N. 52° E. course gives the ship's position at 7 h. 29 m. as 29° S. and 46° W.

The disturbance would have some area, it would not be a mere point.

Now, one focus of Solectric effect exactly connects with the area of ocean on which the ship was then steaming. The moon, Neptune, Saturn and the earth combine to receive the tremendous flow of force rushing from position (A), 150 miles further south and entering the earth at (B) the "chasm."

At position (A) is concentrated the power from the sun and the other five planets, who must lose on balance in the transaction.

With such mighty forces in action we can understand the formation of the "chasm" described by the crew of the "Planet Neptune"; a sketch of which is attempted by the artist.



FIG. 126.

At a 30 knots speed down the incline the ship would travel her own length in "6 or 7 seconds."

In this strange and instructive happening there is a remarkable coincidence. The spot which came near to be the watery grave of the ship "Planet Neptune," was actually prepared by the real planet Neptune, three days before.

On February 23rd, 1 h. 0 m. G.M.T. Neptune was occulted by the moon in $21\frac{1}{2}^{\circ}$ N. and $66\frac{1}{2}^{\circ}$ W. ; a range of $57\frac{1}{2}^{\circ}$ passes over the position which was occupied by the ship at half past 7 p.m. on the 26th.

Nor is that all. On February 23rd, 3 h. 32 m. the moon attained extreme declination $21^{\circ} 6' S.$ and 103 W., nadir, with Neptune a close companion. Again they reached out and prepared the ocean, near the place where the "Planet Neptune" would pass at 7.30 p.m., to receive a tremendous volume of Solectric force.

In this coincidence there were seven planetary chances and thousands of ship-name chances against such an event, yet it happened.

Coincidences are merely interesting, and evidence of nothing.

When steaming homeward during a voyage from South America, I was talking to the Third Officer on watch, one night. Said he, alluding to the Solectric theory, "I notice Sir, you have calculated a Norther for Valparaiso on this date." "Yes" said I, raising my arm and pointing upwards and to the S.W. in the direction of that place

"and I believe at this very hour the Norther has begun to blow." But I did not finish the sentence, for at that moment a huge green meteor flashed out in the very direction to which I was pointing. I was so astonished, that my arm remained pointing until the meteor disappeared. When I turned to address the Third Officer, he backed from me with fear in his face; and I think he scarcely credited me when I tried to explain that my surprise was equal to his.

This was a coincidence, but not of any value as scientific evidence of the Norther, for we were in the North Atlantic and far from Valparaiso.

ROLLERS.

Some coasts are subject to a strange behaviour of the ocean, which has not received sufficient attention to enable a satisfactory explanation to be discovered.

In Rapers' "Practice of Navigation," an excellent book, it is stated that "Rollers is a term applied to a very heavy swell rising on particular coasts, without any known cause, generally very quickly and subsiding very soon, and which constitutes a formidable danger. H.M.S. Julia was wrecked in a calm at Triston d'Acunha in a few minutes. More recently very severe loss was experienced at St. Helena. Rollers are noticed as a great danger on the coast of Guiana, where they break in 5 or 6 fathoms.

"The U.S. Exploring Expedition anchored off San Francisco, November 1st, 1841, the 'Vincennes' being in 7 fathoms and 3 miles off shore."

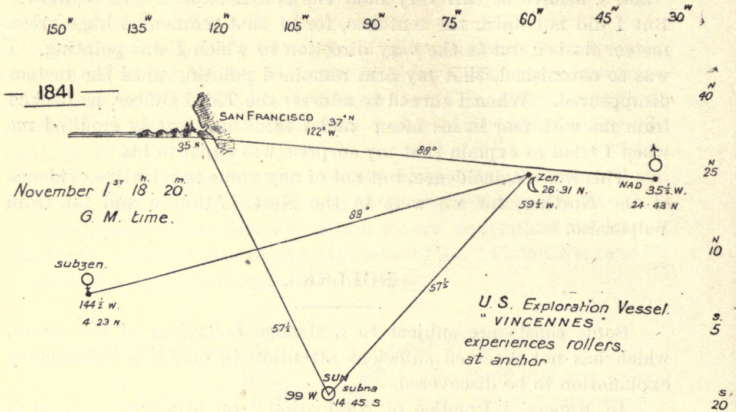
About 10 p.m. the rollers got up and broke with the continued roar of a surf. At midnight a sea broke on board the "Vincennes" a ship of 780 tons, displaced the booms and boats and killed a man. The other ships in deeper water felt no inconvenience.

St. Helena is famous for the visitation of rollers. Sir W. Grey-Wilson, the Governor told me that on May 24th, 1897, the rollers were heavier than they had been for 30 years.

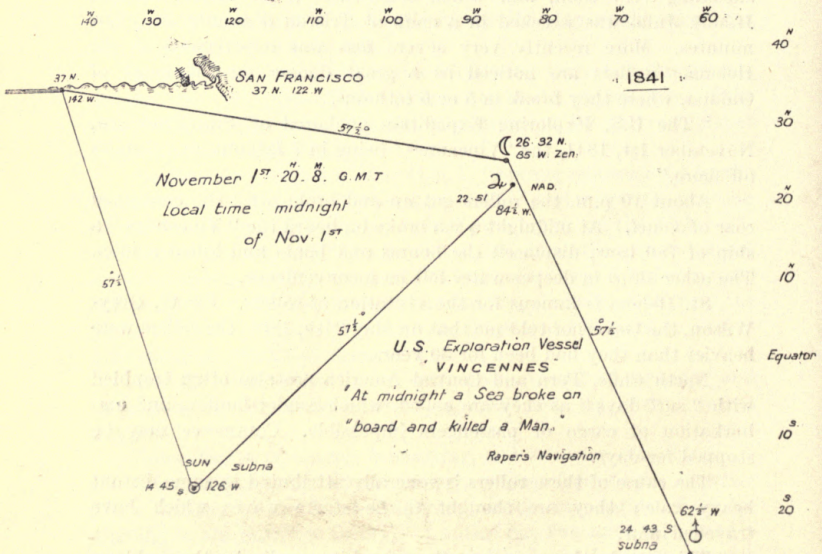
North Chile, Peru and Central America are also often troubled with "surf days" as they are called, which render landing and embarkation of cargo or passengers impossible. Commerce may be stopped for days.

The cause of these rollers is generally attributed to some distant heavy gale; they are thought to be storm waves which have travelled afar.

This may be the cause sometimes, and it complicates the problem but more probably the cause is Solectric.



Local time, Nov. 1st 10. 12 p.m. "About 10 p.m the rollers got up."



FIGS. 127 & 128.

In the case of St. Helena mentioned (1897) I find that the moon gave a warning at extreme declination time ; also two planets were pulling with the sun.

I was voyaging on the Brazilian coast at the time, to the westward of St. Helena, and nothing unusual was recorded.

Rollers were very high on the Peruvian and Chilian coasts on February 22nd, and for some days after in 1902. The continuation points to solar influence. At this same time I was experiencing an extraordinary high swell from latitude 15° N. to 35° N. in the North Atlantic, and made an emphatic note of complaint regarding the discomfort.

I have traced Solectric influence in this also but my notes are too scanty to repay investigation.

The incident mentioned in Raper (p. 373), however, is so accurate as to time and place, and the result arrived at by Solectric calculation so well harmonises with it, we are justified in considering that the real causes of rollers have been at last discovered.

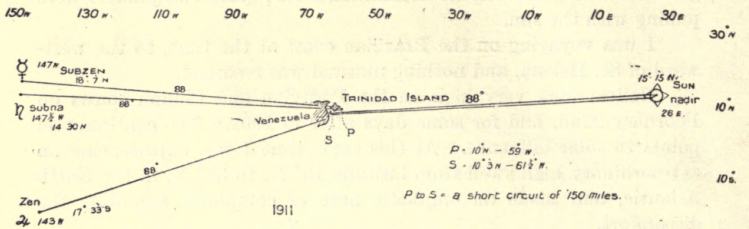
The diagram for 12 minutes after 10 h. p.m., on November 1st, shows that when sun and moon are $57\frac{1}{2}^{\circ}$ from each other a powerful concentration focus has just opened out clear of the coast near to San Francisco.

This raises a cone of water, say 20 ft. at highest part above ocean level, and as new areas are placed under the focus owing to the earth's rotation, the waves follow fast ; hence the sound of continued " roar of surf about 10 h. p.m.," as the rollers dash against the coast. The combinations develop more powerfully along the parallel of latitude of San Francisco during the next two hours ; and as the earth rotates eastward under these foci the height of the rollers increases. The second diagram shows the Solectric position at midnight when " a sea broke on board the ' Vincennes.' " The moon now acts on the ocean in combination with the sun and Jupiter and raises a dangerous sea. How simple it looks. Thus after a lapse of 75 years we are able to explain why the seaman of the " Vincennes " was killed on the night of November 1st, 1841.

Among strange natural phenomena must be included the birth of an island from the ocean ; the forging of land, the sudden creation of earth in the sea.

The three warnings set out in these diagrams show that the affected district had been well charged with solectric force previous to the island's appearance ; see diagrams 129, 130 and 131.

Besides the usual warnings so often mentioned, there was an unusual one—the position of sun and moon at the time of the sun's



NOVEMBER 4th - 10^h - 0^m G.M.T. LOCAL TIME, 5^h 52^m PM. NOV^r 4th

An island rises from the ocean at S. in fire and smoke

FIRST WARNING

☉ = Position of SUN

and Moon at the time of
greatest eclipse of the Sun

OCTOBER 21 - 15.51. GREENⁿ M.T.

○ = 10° 38' N 61½° W nadir.

☾ = 10° 18' N 61½° W nadir.

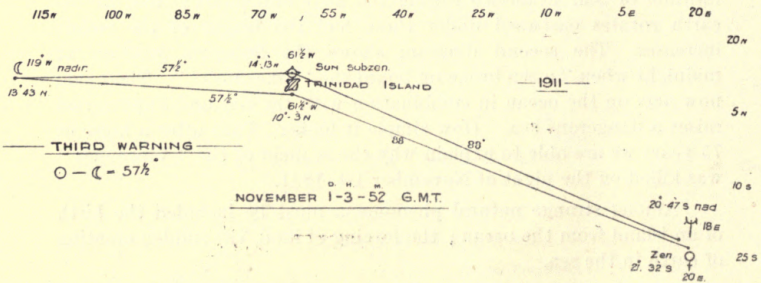
1911



SECOND WARNING

Moon at extreme Declination
October 27th 5^h 24^m G.M.T.
The arrows point to the dot.
representing the Island which
came up from the SEA in
10° 3' N. and 61½° W.

Extreme declinⁿ 28° 6' 37" S.



THIRD WARNING

○ - ☾ = 57½°

NOVEMBER 1-3-52 G.M.T.

FIGS. 129, 130 & 131.

greatest eclipse on October 21st, which was almost vertically over the spot where the island afterwards came up.

When the island rose from the sea there was great positive soelectric pressure on the earth due to three planets and the sun short circuiting.

The only safe proceeding was to transform power into material, which was done by the creation of an island.

The following interesting account of this event is copied from the London Press.

BIRTH OF AN ISLAND. ATLANTIC PHENOMENON.

PORT OF SPAIN,

November 6th, 1911.

An island has risen from the water in the Serpent's Mouth Strait, between Trinidad and Venezuela.

The phenomenon was preceded by extraordinary commotion in the sea, and huge columns of smoke and flames were seen.

ISLAND BORN IN SMOKE AND FIRE. PEOPLE WHO MISTOOK IT FOR THE END OF THE WORLD.

PORT OF SPAIN,

TRINIDAD,

November 7th.

The upheaval of a small island off the southern coast has naturally created some excitement in the colony, especially in the district where this strange phenomenon occurred.

Nothing but the end of the world could, in the eyes of the country people on the adjoining coast, be happening when clouds of smoke and fire, hundreds of feet high, were belched apparently from the open sea, and they deserted their dwellings *en masse* and either fell on the road and prayed, or fled to the woods for shelter.

The height of the flames may be understood from the fact that they were seen in Port of Spain, 40 miles away. The first intimation of anything unusual was on the morning of the 4th November, when a fisherman observed a small cone of land protruding from the sea, where he knew no land had existed before. On approaching, he found the water bubbling all round, and getting frightened, rowed away.

During the evening there was a loud report, immediately succeeded by a dense column of smoke and then fire. This continued, but gradually diminished until the early morning.

The news was communicated to the Governor, Sir George Le Hunte, the same night, and early next morning he left in one of the Government steamers with a small party to visit the place. On arrival it was found that the island, then about $2\frac{1}{2}$ acres in extent, was situated some two miles off the village of Chatham, in the Bay of Erin, where Columbus is said to have landed on his discovery of Trinidad, and 12 miles from the Boca de la Sierpe, or Serpent's Mouth, the southern entrance to the Gulf of Paria. Although the surface was still hot, the party managed to land, and found the crust fairly hard towards the centre of the island.

Two craters stood out, about 6 ft. in diameter. The highest point was about 15 ft. above sea level. There was a distinct smell of oil and sulphur, and gas was still escaping from the craters. Gas could be heard rumbling below, and in the opinion of an expert who was present the phenomena were due to an eruption of a mud volcano, occasioned by oil gas. The fossilised remains of marine animals were noticed.

The expert accounted for the blaze by the striking together of rocks containing iron pyrites, which ignited the gas, and caused the explosions and fire.—Reuter.

The expert, who accompanied the Governor in order to explain these happenings, accounts for the blaze, etc., by the striking together of rocks. The fisherman says he noted the water bubbling all round and became frightened. He makes no remark about a smell of gas. The water was probably boiling. Only a small cone of land was visible, and no rocks were striking together. Suppose a house were burnt down, and an expert were sent to discover the cause of the accident; and suppose his report was that the house was built of inflammable material and was destroyed by taking fire. Would this statement satisfy an insurance company; and does the above explanation about the rocks satisfy any person of average intellect.

Solectrics has taught us what forces the sun and planets wield and what consuming fires they can develop; so that future experts presiding at these births need no longer stifle our curiosity with a "mud volcano" composed of rocks striking fire.

HEAT AND COLD WAVES.

Changes of temperature over the earth's surface take place gradually, as a rule.

On this account the causes of the change are difficult to indicate; the effects often follow after a day's interval, and are cumulative if similar combinations continue to develop.

The gradual change is evidence that Solectric bodies are moving into positions which will cause an increase or decrease in the temperature recorded over a certain country or district.

Sudden changes may happen as the result of a storm ; for instance Melbourne could tell of northerly " brick dusters " blowing with a heat of 100° F., and of a southerly " buster " rising which would in an hour reduce the temperature forty degrees.

Again a traveller might be journeying in Red Sea regions on a calm day having a tolerable temperature, when a sudden breeze across the desert would lift the incumbent air quivering in a depression or valley, and roll it over man and beast, enveloping them in suffocating heat. These cases are simply explained.

This inquiry, however, refers to effects over large areas, and it is here asserted that not only the sun but the moon and each planet have the power of directly influencing temperature on the earth's surface, so as to cause when working in combination, either extreme heat waves or intense cold.

The examples given are samples of many which have been calculated to demonstrate and prove that the Solectric theory is able to explain these extreme weather changes.

It is curious that while engaged on this article, toward the close of the year 1916, an important London Daily should print the following paragraph on the moon's weather influence, followed next day by the second paragraph.

People who rely on the moon as a weather indicator (writes a correspondent) must have very short memories, for accurate comparisons prove conclusively that there is no connection whatever between the weather and the moon's changes of phase. Professor Schuster analysed a whole century's weather records, and as a result, was unable to trace any lunar period in them. Several authorities are agreed, however, that there is a tendency for clouds to disperse as a full moon comes to the meridian of any place ; but it is a far cry from that to the definite belief that the weather changes with a change of the lunar phases. These changes, of course, can be predicted for years in advance with perfect accuracy, and if the weather depended on them, weather forecasting would be the simplest of all the sciences, instead of the most difficult. The moon, too, does duty for the whole earth, and should ensure uniformity of weather conditions everywhere, if it were the important factor asserted ; as a fact, at any given moment every possible kind of weather is in operation in different places, and even in England's comparatively small area ideal weather in one place often synchronises with wretched meteorological conditions

in another a few miles away—and this happens with every possible lunar condition.

Beliefs in the influence of the moon upon the weather, are of all cherished illusions, the very hardest to kill. One such that "the full moon eats up the clouds" has found no support from systematic observations, Professor Gregory tells us. "The only definite association that can be regarded as established between changes of the moon and weather," he adds, "relate to the occurrence of thunderstorms, and it is noteworthy that this is overlooked completely in proverbial philosophy. Thunderstorms are found to be slightly more frequent near new moon and the first quarter than near full moon and the last quarter."

The first paragraph states that several authorities are agreed that a full moon is able to disperse clouds. Professor Gregory thereupon tells us that from systematic observations the moon has no such influence.

The other Professor can trace no lunar period in a century's record. This book has been written in vain if the reader does not perceive that natural phenomena are the result of the continuous permutations of ten Solectric bodies, and perhaps more.

The Solectric interaction upon one another of the sun, moon and eight planets is the mighty cause of the wonderful displays of force discussed in this book, and of weather also.

Superior people tell us that "Beliefs in the influence of the moon upon the weather are, of all cherished illusions the very hardest to kill."

With such like phrases do certain scientists greet the amateur who dares to research, he not being decked in University robes.

The most insolent and patronising branch of science is that of meteorology, because it is the most ignorant.

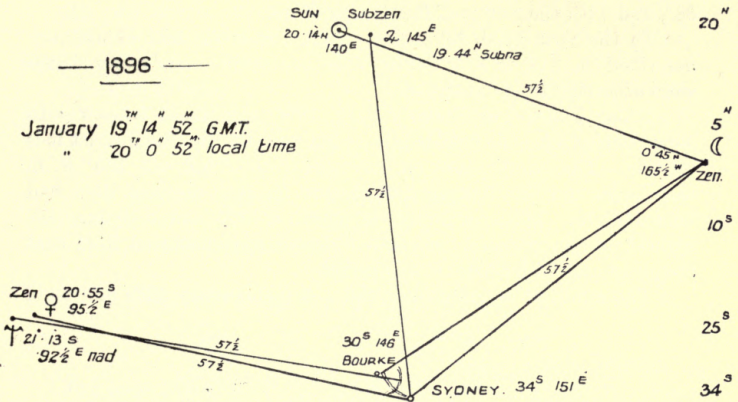
With regret I remember how often my inquiries, sent to authorities both at home and abroad, regarding time and place of an event have received no reply, or else an evasive answer on a large sheet of paper.

A philosopher does not well to be angry; let him rather rejoice, that before a long time certain scientists and meteorologists will have to absorb the moon, likewise all the planets, into their intellectual cavities, for not otherwise can Nature's greatest works be understood.

The following examples of heat and cold are extreme cases, because those cases are the simplest to explain and illustrate by diagram. It was noted in the first chapter that important results followed from the direction of flow of the Solectric force.

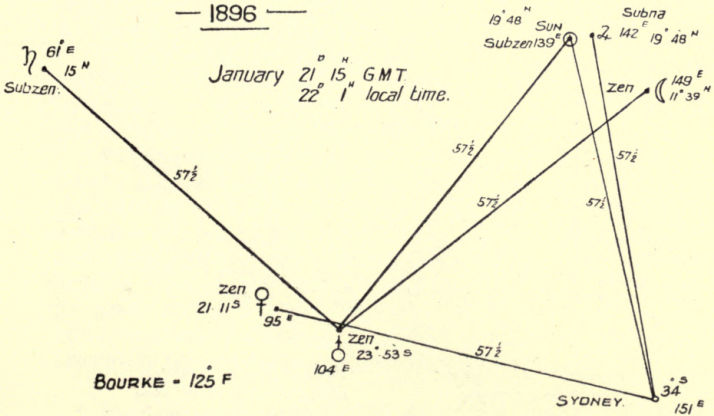
We shall now see that when a position is acted upon by negative

January 19TH 14^H 52^M GMT.
" 20TH 0^H 52^M local time



60° 75° 90° 105° 120° 135° 150°

January 21^D 15^H GMT.
22^D 1^H local time.



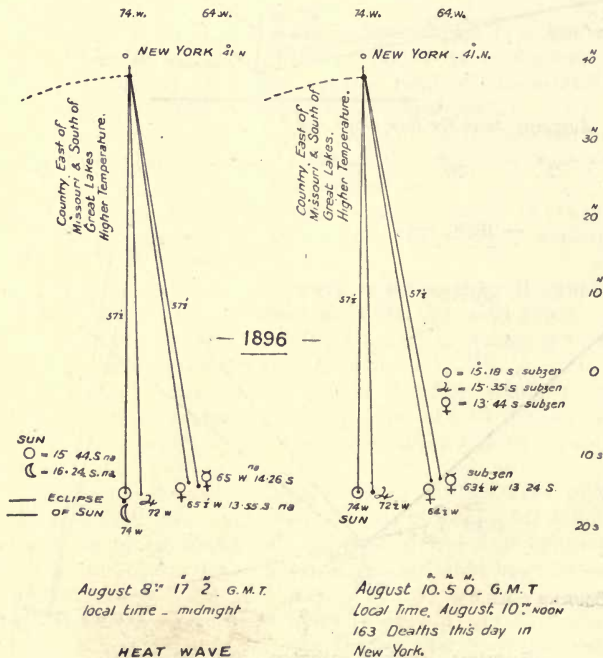
FIGS. 132 & 133.

Solelectric force heat is set up at that position. Negative force is given off by Solelectric agents when they act at relative distances of $57\frac{1}{2}^{\circ}$ from one another; positive force is associated with the distance 88° , and with the causes of low temperature.

In the year 1896, telegrams during the latter half of January described the heat in New South Wales as terrific; and many deaths were occurring from sunstroke.

"The Times" of January 24th, 1896, reports as follows:—In New South Wales the heat is protracted; in the Bourke district it is terrible. The temperature on Wednesday the 22nd was 125° F. in the shade, and the average temperature for four previous days had been 118° . The average for the month is 112° , and at Sydney the highest on record there. Forty-five deaths have occurred from heat apoplexy and all business is suspended.

The annexed diagrams 132 and 133 for January 20th and 22nd



FIGS. 134 & 135.

local time, show clearly why Sydney and Bourke suffered so greatly from heat. The sun, moon and three planets are acting at $57\frac{1}{2}^{\circ}$ on these places at about 1 h. p.m. local time.

The sun and Jupiter are very strong.

The next case is taken from the "Standard" August 12th, 1896, reported from New York.

The first diagram 134 shows the Soleetric position on August 9th when there was an eclipse of the sun, and the second, diagram 135, is worked for one day and a half later, August 10th, 5 h. G.M.T.

THE UNITED STATES.

THE GREAT HEAT WAVE.

HEAVY MORTALITY.

NEW YORK,

Tuesday Night, 11/8/96.

The heat, which has been remarkable since Wednesday, 5th inst., has now become of an unprecedented nature. The New York "Herald" reports that the number of deaths yesterday officially attributed to that cause in New York and the suburbs was 163. Since Wednesday 266 persons had been prostrated by the heat, and it was believed that several hundreds of cases, in addition, which had not been officially recorded, had occurred within that limited district. In the area east of the Missouri River and south of the Great Lakes it has been hotter than here, and the victims are reckoned by thousands. The sheltered Government thermometer stood at 91° in the shade. The "Herald's" thermometer, not exposed to the sun but on the street level, registered 101° .

The "Herald" declares that such an amount of suffering and fatality from this cause has never been known here before. Other journals compare it with the years 1872 and 1892. The humidity and sultriness and the absence of a breeze explain the extreme discomfort now experienced, as the same temperatures have before now been endured more easily. These deaths from heat have greatly raised the death-rate above the low figure recently recorded as a consequence of the sanitary improvements. Horses have been falling dead in the streets faster than they can be carted away.

LATER.

The mortality at Chicago yesterday, August 10th, 1896, was the largest yet recorded. A thousand carcasses of dead animals threaten the health of the city. At New York to-day the thermometer at the

Weather Bureau stood at 94° , and on the street level at 101° . The evening papers publish a list of the heat casualties, which occupies two solid columns. Twenty-five thousand people slept last night in the docks. The throngs of excursionists from the city exceeded the capacity of the boats and railways to bring them back.

This combination of Jupiter and the two inferior planets with the sun is more powerful than a combination of any other planets with the sun, for developing heat.

The next example is from South America. The heat at Buenos Ayres during the last week of January, 1900, had been phenomenal, but its intensity increased during the first days of February.

The Buenos Ayres "Herald," of February 9th, 1900, contains the following:—"The heat wave in Buenos Ayres. Hundreds of corpses awaiting burial. Military assistance. Terrible scenes. For the past two weeks the heat has been phenomenal, and it has gone on accumulating until it may be said to have reached the point of human endurance on Thursday last, February 1st, and to have remained at that point from then until Sunday evening, February 4th, about 9 o'clock, when the welcome sound of Heaven's artillery was heard, and the pent-up clouds gave up what we had all been longing for with uplifted eyes, the gentle rain from Heaven.

"This rain continued more or less into the morning, and at sunrise, as the writer wended his way home, from scenes which would have made the stoutest hearts quail, the air felt as soft and balmy as one experiences only once or twice in a lifetime.

"The effects of the great heat wave began to be felt in all their force on Friday, February 2nd, and the public ambulance corps was really called in then for the first time to render aid to many a sufferer who dropped down in the streets.

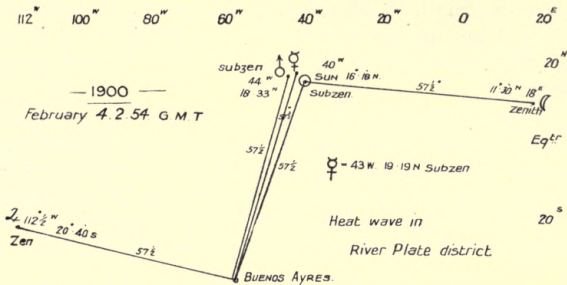
"On Saturday, February 3rd, the heat was more intense, and many more victims were added to the large list; but on Sunday, February 4th, the climax was reached when the ambulance corps dealt with 320 cases of sunstroke, the majority of which proved fatal."

Two weeks previously the heat began to be excessive, and on January 26th the sun and moon were $57\frac{1}{2}^{\circ}$ apart, aided by Saturn.

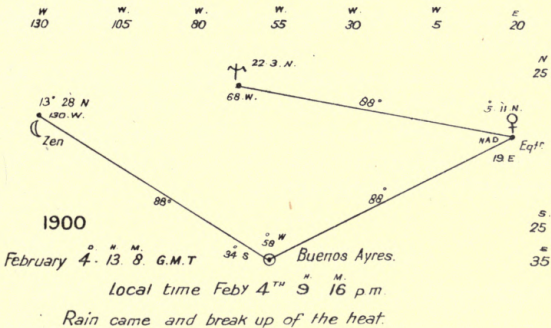
This warning combination fell on Buenos Ayres and caused the temperature to rise.

The diagram 136 for February 4th, 2 h. 54 m. G.M.T., shows graphically what were the causes which acted on Buenos Ayres and produced so great a heat that many died in the streets.

The "Herald" says at about 9 o'clock on Sunday evening,



Hottest period 320 cases of sunstroke



FIGS. 136 & 137.

"February 4th, the welcome sound of Heaven's artillery was heard, etc.," and the heat wave was dispersed by rain.

What caused this longed for change in the weather? The annexed diagram 137 calculated for 9 h. 16 m. p.m. at Buenos Ayres answers the question. There are now three elements of 88° acting on the city, refreshing all things with positive force and making the air feel as "one experiences only once or twice in a lifetime."

The case needs no amplifying; no adornment beautifies the Truth.

Let us shift the scene to England.

During the month of July, 1911, the weather in England became very hot, and this unusual temperature culminated on August 9th. The following cuttings from the Press describe the meteorological conditions.

Once and once only, since accurate records were first taken, have Londoners experienced a shade temperature within two degrees of 100°, that happening on August 9th, 1911, when several reliable instruments in the City registered between 96° and 98°, and for a few minutes the thermometer at Greenwich Observatory, which has been used as the Greenwich standard since 1840, stood at 100°.

HOTTEST DAY ON RECORD.

“LONDON CHRONICLE,” *August 10th, 1911.*

All heat records in this country were broken yesterday, August 9th, the temperature at the Meteorological Office at South Kensington reaching 97° in the shade.

This figure was also attained at Hillington, in Norfolk, 96° was reached at Lincoln, 95° at Kew, and 94° at Nottingham.

Unless unexpected thunderstorms bring relief, there is every prospect that the temperature may rise still higher. There was last night no sign of a break in the weather.

HEAT-STRICKEN CITY.

TEMPERATURE TOUCHES 90° AT 9 O'CLOCK.

The highest temperature ever recorded officially in London was reached yesterday, August 9th, the thermometer at the Meteorological Office, South Kensington, touching 97°. A similar figure was recorded at Hillington, in Norfolk.

It was early evident that the day was going to be phenomenally hot. There was not a breath of air, a slight “heat haze” hung about, and as early as 9 o'clock the thermometer had climbed to 90° in the shade. Thereafter it rose steadily until the maximum was attained.

In the City the heat was naturally severely felt, and unfortunate people who were compelled to traverse the sun-scorched streets experienced tropical conditions. Curiously enough, however, the maximum temperature recorded in the City did not equal that at the Meteorological Office. The hourly readings by Messrs. Negretti & Zambra's instruments in Holborn Circus were :—

perature over England; yet we can separate the action of each soelectric body and show on what position its influence falls.

A typical case of a cold wave will now be given.

The "Graphic" of February 16th, 1895, says: "Early on the morning of February 6th, 1895, the thermometer fell to zero in the Midlands, and all over the British Islands it was considerably below freezing point."

The Thames was frozen over, and from London Bridge to Surrey Commercial Docks was a solid mass.

The Medway from Sheerness Dockyard to the Isle of Grain was frozen over; and communication with the guardship "Thunderer" at the Nore cut off.

All over the country was much distress through the cold, and wild birds died in hundreds.

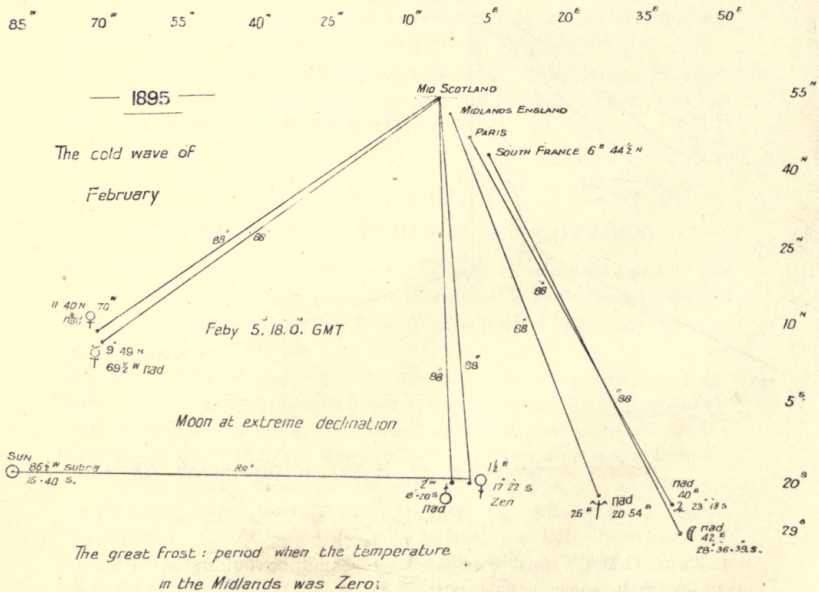


FIG. 139.

The cold lasted for some weeks, but the morning of the 6th February and the 7th were the times of greatest intensity.

These extreme temperatures usually synchronise with the moon's very high declination north or south.

In this instance, on the morning of the 6th February, the moon was at $28^{\circ} 36' 39''$ N., a very high declination, and the diagram 139 is calculated for that particular time February 5 d. 18 h. G.M.T. Severe cold is reported from Scotland and as far as South of France.

The lines of 88° demonstrate the peculiar power of positive soelectric force.

The months of January and February, 1917, in the British Islands will be remembered as months of frost and snow. January was draped in gloom, and though the sun broke through in February the temperature fell lower than before. The cause of this lengthened period of melancholy weather was a series of moon positions when at extreme declination from which were cast arcs of 88° over England and adjoining countries.

On January 5th 12 h. the moon was on extreme declination north and 88° away from British Islands. But at this time the sun and all the planets were likewise throwing positive Solecric arcs of 88° over various districts of our islands and of the continent.

On January 19 d. 22 h., on February 1 d. 18 h., and on February 16th 8 h. the moon was, on all these dates at extreme declination and in a similar position for striking cold into Western Europe, as on January 5th. Likewise the sun and many planets acted in company with the moon and to the same effect. Diagrams have been drawn to illustrate this remarkable influence, but I avoid burdening the book with more.

The sun's influence at 88° is also for cold, and covers a greater area than does the moon's influence because owing to the sun's slower movement more area of the earth rotates under this influence at such a time. On March 20th, 1917, app. Greenwich time the sun's centre was on the Equator. While crossing it the sun from its nadir position threw a broad arc or belt over England, etc., and this caused a month more of winter for soldier and farmer to battle against. On that day a cold north wind and snow squalls signalled the coming month.

The last example is that of a cold wave which passed over England in February, 1912.

“DAILY MAIL,” FEBRUARY 5TH, 1912.

BELOW ZERO.

COLDEST DAY FOR 45 YEARS.

35 DEGREES OF FROST.

SNOW PLOUGHS IN LONDON.

SKATERS' CARNIVAL.

Saturday, February 3rd, was the coldest day for 45 years. At Dover on Saturday night the meteorological station registered 35° of frost—3° Fahrenheit below zero. At Norwich the mercury touched half a degree below zero. This is the most severe February weather recorded in England, and the coldest weather since January 4th, 1867, when the thermometer stood at 4° below zero in London.

The following table shows the degrees of frost registered at other places during the week-end :—

Degrees.			Degrees.		
Westmoreland	...	29	Nottingham	...	15
Reading	...	23	Blackpool	...	15
Border District	...	22	Malvern	...	13
Lincolnshire	...	20	Weston-super-Mare	...	13
Birmingham	...	18	Aberystwyth	...	11
London	...	17	Weymouth	...	10
Harrogate	...	17	Torquay	...	7
Newcastle	...	17			

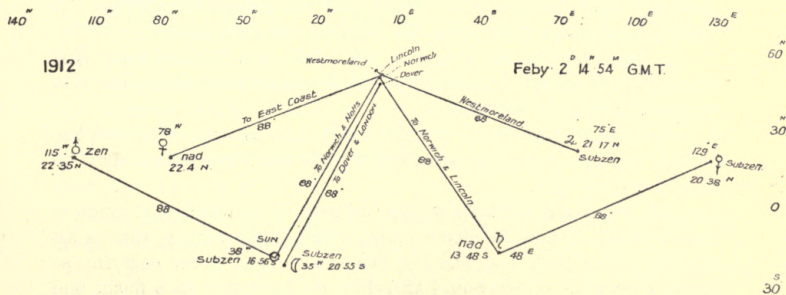
Snowstorms, accompanied by a strong, keen, northerly wind, swept nearly all parts of the country during the week-end.

London yesterday morning, 4th February, was a city of silence. A soft white carpet of snow hushed the sound of all traffic and intensified the usual Sabbath calm. People on their way to church trod noiselessly the white-clad pavements. Only the church bells broke the silence.

The first diagram 140 is calculated for January 30 d. 21 h. 38 m. G.M.T. the time when the moon was within 5 seconds of attaining extreme declination N.

This diagram is very instructive, and every solelectric body contributes to the general condition. Each line of 88° has its particular objective marked along it, although their arcs over the land must often intersect.

The second diagram, February 2 d. 14 h. 54 m. G.M.T., shows the position at the time when the lowest temperatures were



Dover temperature on Feby 3rd - 3° below Zero.

FIG 141

experienced. The East coast is assailed with vigour and the cold is greatest there.

A more accurate explanation of heat and cold waves, nor one so fully satisfactory, has never been discovered, so we may pass on to other problems after a further observation. The planets during their conjunction with the sun cause cold waves, the sun's heat being drawn away from the earth; in opposition there is a reverse effect. Jupiter for example in conjunction with the sun produces a cold snap over the areas directly affected; but when Jupiter is in conjunction with the moon rain storms are produced. Each planet produces its special effect and if acting in company with others they produce complicated results, weather samples not easy to unravel.

ASYLUMS.

The Romans must have noted centuries ago that certain persons were liable to fits of insanity at intervals, more especially at the period of full moon.

In some of our institutions I learn that extra assistance is required at about full moon time to attend lunatics.

I recollect one fine day visiting a gentleman on business and I found him in the hall with an umbrella over his head. He was sitting on a chair crooning and sighing, but not unhappy. I was requested to wait a while, as master was often so, at full moon, but, said the maid the attack will soon pass.

In this instance Luna (the moon) removed her influence in half-an-hour.

Again, it is not an infrequent occurrence in summer for a strong man to be killed by sunstroke. The surrounding temperature probably may not exceed 90° Fah., and yet many persons may fall unconscious in the street from the effect of the sun's rays.

A man can tolerate a heat of 200° Fah. in a Turkish bath, and even a much higher temperature, yet he may die of sunstroke in a temperature under 100° Fah.

Evidently these effects are not due to heat alone. They are due to the volume and high potential of soelectric force which may be passing at the time.

By short circuiting a strong current of electricity through a man's body, he may be electrocuted. The man's nerves, that is his electric conductors, had not the necessary capacity for carrying so great a charge. They would therefore be destroyed in a flash, and life would cease as communication between brain and muscle would be non-existent.

Similarly the harmonious working of a weak brain may be destroyed by the passage of a peculiar quality of solelectric force, such as a force from sun or moon which had been modified by a planet's influence ; or even the passage of a solelectric current at too great a potential for a weak brain to tolerate, might irretrievably damage the judgment and mind of the sufferer.

We shall follow up this argument by selecting examples of sudden outbreaks at asylums for the weak-minded. After the suitable calculations have been made we shall then be able to judge as to whether the outbreaks were caused by the solelectric condition then in force, or were due to some other agent not yet discovered.

In 1890 there appeared a notice in some of the London newspapers to the following effect :—

OUTBREAK OF CRIMINAL LUNATICS, 1890.

PARIS, *May 27th*

A very serious outbreak took place yesterday at the Criminal Lunatic Asylum, Bicetre.

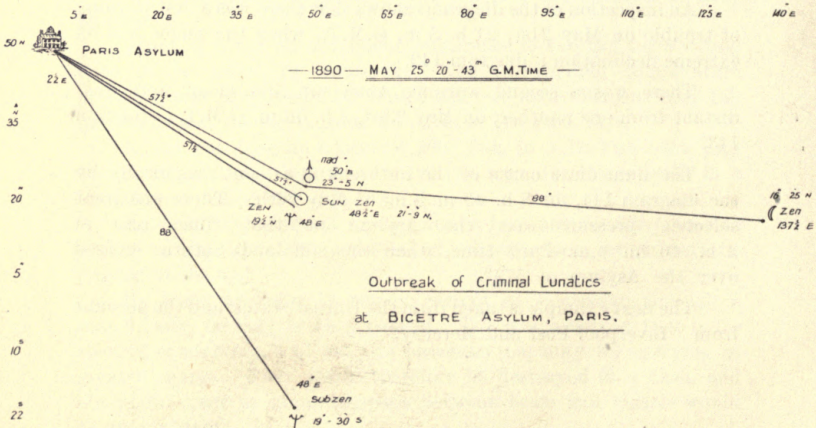
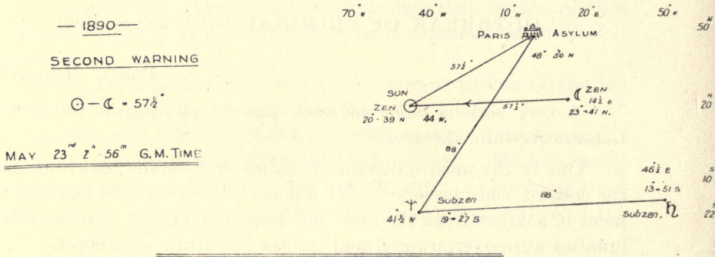
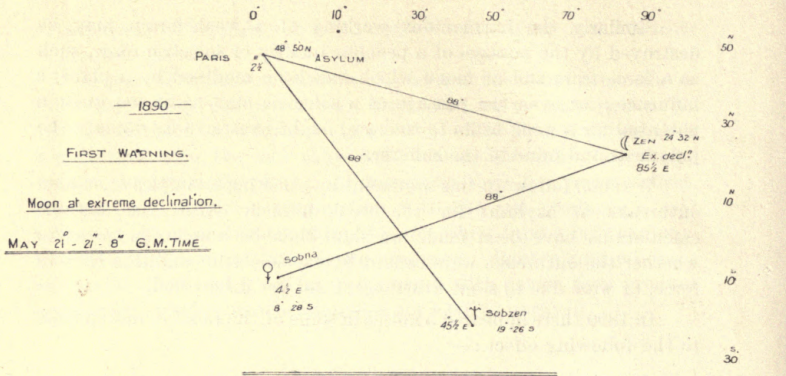
One of the most dangerous lunatics broke some bars and opened the cells of other prisoners. It was found necessary to call a detachment of soldiers from the fort, and after a good deal of resistance the lunatics were overpowered and confined in strait waistcoats.

An inspection of the diagrams shows that there was a first warning of trouble on May 21st, 21 h. 8 m. G.M.T., when the moon was on extreme declination ; diagram 142.

There was a second warning when sun and moon were $57\frac{1}{2}^{\circ}$ distant from one another, on May 23rd, 2 h. 56 m. G.M.T. ; diagram 143.

The immediate cause of the outbreak is set out graphically by the diagram 144, for 8 h. 43 m. a.m. of May 26th. There was great solelectric pressure over the Asylum at that time, also at 2 h. 46 m. p.m. Paris time, when the sun and Saturn crossed over the Asylum at $57\frac{1}{2}^{\circ}$.

The next example is taken from the United States, and the account from " Liverpool Post and Mercury."



FIGS. 142, 143 & 144.

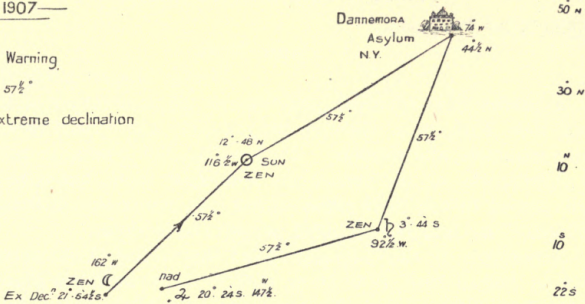
170 150 130 110 W 90 70 W

— 1907 —

Double Warning.

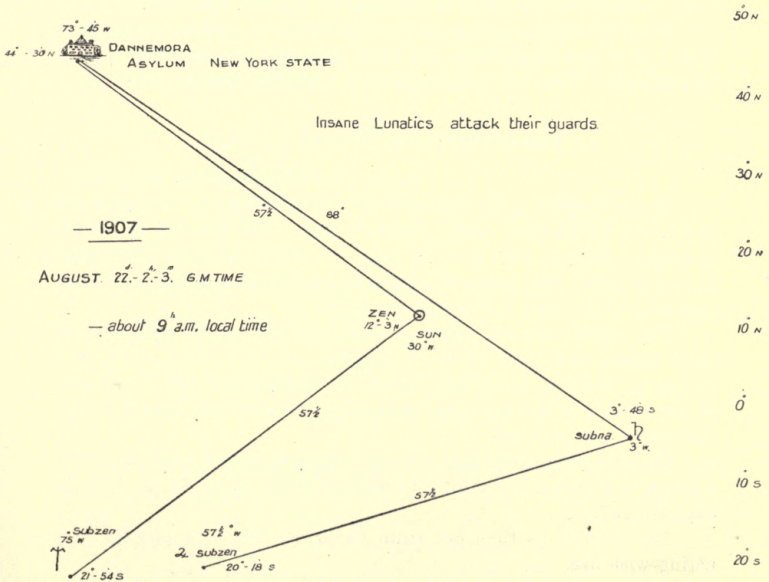
(— ○ — $57\frac{1}{2}^\circ$

(at extreme declination



AUGUST 19th 1950 GREENWICH MEAN TIME

60 W 70 W 60 W 50 W 40 W 30 W 20 W 10 W 0 W



FIGS. 145 & 146.

FIGHT WITH 300 LUNATICS.

Central News Telegram.

NEW YORK,

Friday, August 23rd, 1907.

A terrible fight occurred yesterday at the penitentiary at Dannemora, New York State, between the inmates, who consist entirely of insane criminals, and warders. The lunatics, 300 in number, attacked the guards, who at first turned the hose upon them, but were afterwards forced to use their rifles. After two hours the outbreak was subdued. One inmate was killed and several injured.

A reference to the diagrams shows that notice of the event was given on August 19th, 19 h. 50 m. G.M.T. Two warnings were given at the same time, because the moon was then $57\frac{1}{2}^{\circ}$ distant from the sun, also on extreme declination, when 88° from the Asylum at Dannemora, diagram 145.

The second diagram 146, August 22 d. 2 h. 3 m., shows that three planets are assisting the sun to excite and fever the brains of the inmates of Dannemora lunatic asylum.

One wonders if it is possible to shield or protect these institutions from Solelectric effects, after the manner of lighting conductors.

There is much reticence as to occurrences in lunatic asylums, so that I have had more than the usual difficulty in gathering reliable information. The following instance is from the London press.

REFORMATORY MUTINY, 1912.

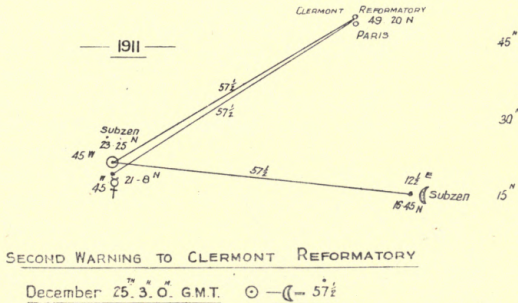
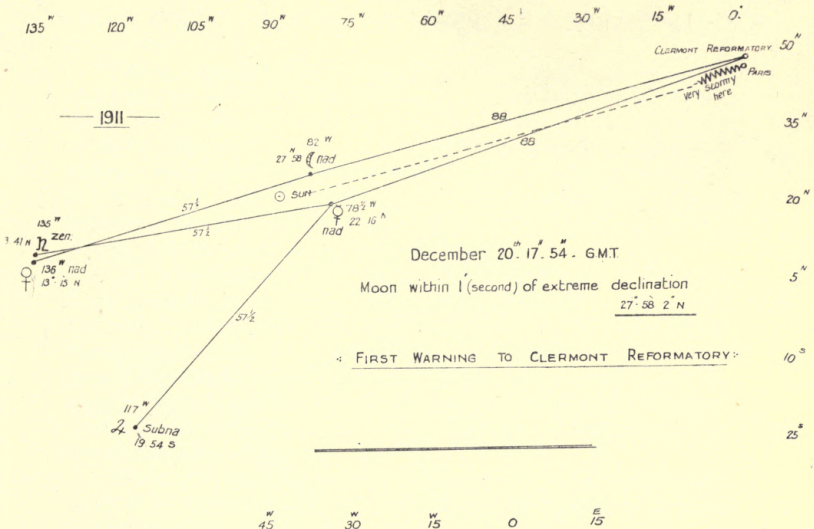
PARIS, *Thursday, January 4th, 1912.*

Three hundred girls mutinied at a reformatory at Clermont for five hours on Tuesday night, January 2nd. The director of the reformatory pleaded with them in vain, and when attempts were made to restore order, the girls took refuge in the dormitories and corridors, smashing everything they could lay hands on.

The police were sent for, and when they arrived the girls took off their sabots and used them as weapons to keep the officers at a distance. Further assistance had to be summoned, and it was only at one o'clock in the morning, after 34 of the girls had been arrested, that peace was restored.

The first warning of this outbreak was manifested when the moon was on extreme declination, December 20th, 17 h. 54 m. G.M.T., diagram 147.

The moon was then 88° from Clermont and four planets were acting with her.



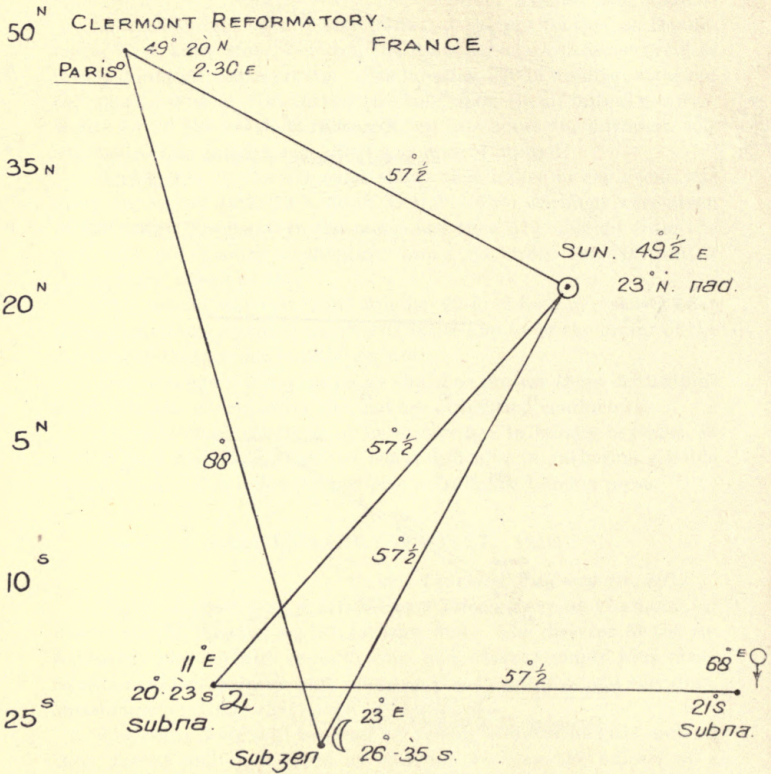
FIGS. 147 & 148.

The sun was acting alone over a district to south westward, but at Paris and as far as Bay of Biscay, very stormy weather was reported owing to the powerful Solelectric action set up between the sun's position and that of the moon's strong combination.

The second warning took place when the sun and moon were

5 W 1 E 10 E 25 E 40 E 55 E

— 1912 — January 2^d - 8^m - 46 G.M.T



Mutiny at a girls reformatory began about
this time The moon is at a range of 88° until
midnight From CLERMONT

FIG. 149.

distant $57\frac{1}{2}^{\circ}$, as set out by the diagram 148 for December 25th, 3 h. G.M.T. (1911).

There were also exciting combinations overhanging Clermont on January 2nd (1912) at 8 h. 46 m. a.m. also at 6 h. 44 m. G.M.T., which are not shown, but these served to irritate and disturb the girl inmates, until at 8 h. 46 m. p.m. G.M.T. of same day, they could tolerate their distressed minds no longer, see diagram 149, January 2 d. 8 h. 46 m. Thus the girls sought relief in violent behaviour and activity at the time when sun and moon again cast the shadow of their strange influence over the prison at Clermont.

The well-known Italian writer, Cesare Lombroso, Professor of Legal Medicine at the University of Turin published at Milan 1871, his book "*Azione degli Astri e delle Meteore sulla menta Umana.*" Lombroso speaking of "The influence of weather on the insane," says, "A series of clinical researches, which I carried on for six consecutive years has shewn me with certainty that the mental condition of the insane is modified in a constant manner by barometrical and thermometrical influences.

When the temperature rose above 25° C, 30° and 32° C (77° to $89^{\circ}6$ F), especially if the rise was sudden, the number of maniacal attacks increased from 29 to 50.

On the days on which the barometer showed sudden variations especially of elevation—and more particularly two or three days before and after the variation—the number of maniacal attacks rapidly increased from 34 to 46.

This meteoric sensibility as I term it, increased in an inverse ratio to the integrity of the nervous tissues, being very great in idiots, and slightest in monomaniacs.

The study of 23,602 lunatics has shown me that the development of insanity generally coincides with the increase of monthly temperature, and with the great barometrical perturbations in September and March."

Professor Lombroso is perhaps the most esteemed authority on these subjects.

It is interesting to note that he attributes some development of insanity to "barometrical perturbations." The barometer itself can of course, have no effect; the movements of the barometer are due to the movements of Solelectric agents; in other words tempests of all kinds, storms of the atmosphere, nerve storms, and brain storms as we have just shown can be caused by the perturbations of sun, moon and planets.

We began this work by showing that Solelectric force was responsible for the rotation of the earth on its axis; and having worked

through many and various phenomena we find ourselves, as it were, in a lunatic asylum studying with Professor Lombroso. And the conclusions we arrive at are very similar.

This Solectric theory, so perfect in time, place and circumstance seems to unite a thousand puzzling problems into one consistent design. If the Creator of all things had the idea of forming a solar system which should be automatic in its movements, and ultimately beneficial in its effects, we can perceive the system at work every day.

It seems to be in the general scheme of things that we must vanquish much evil before attaining any good. It is as if the world has attained to the period when the automatic impetus is dying out, so far as the governance of intelligent life is concerned.

Away back in the centuries which have lapsed, Nature's rule consisted of one law among living things namely Might is Right.

Morality is unknown to Nature apart from Man. But Man is a development of Nature, and decrees that Right shall be Might in some future day, not very far away.

We are sailing through space in charge of this particular planet, and along with our brother planets we circle continually around the life giving sun. It is in our power to make this planet an abode of happiness, where Truth shall reign supreme.

The time has not yet dawned when locks and keys shall be obsolete and no man shall do evil to another.

Man's intelligence, however, is equal to the problem, and waits only on Will to do.

When surveying this wonderful solar system and the details of even this one small planet we are struck with the power and intelligence displayed. A volcanic eruption, an iceberg, a growing plant, a moth's wing are marvellous works.

Man himself is equally so. Are we to believe that he has been produced merely to suffer grief, anxiety, trouble, pain, and to labour in and out of season to obtain food or gain a little hour of pleasure, and after that, there is nothing. There is no wisdom in such a design, only folly; and even this work will show that our planet and its ways are not founded on folly.

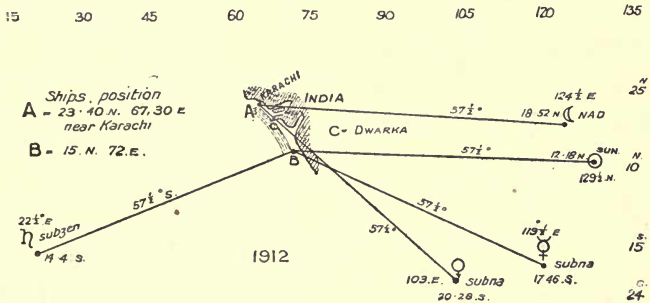
We shall now conclude by giving two examples of gentle behaviour on the part of the Solectric forces, which will illustrate the ceaseless flow, through and round the earth, and to and fro.

On the 13th February, 1912, the sun and Uranus threw arcs of $57\frac{1}{2}^{\circ}$ over a position A on the coast of Kutch, India. At this moment 3 h. 58 m. p.m. G.M.T. the moon was within one second of attaining extreme declination, and Mars combined to cross with the moon at

$57\frac{1}{2}^{\circ}$, over a position to the north westward of the sun's position A already mentioned. This cross was in 26° N. and 66° E., north-west of Karachi, and all this coast region became negatively charged with Solectric force.

On February 17th, about 8 h. p.m. local time, the steamer "Ariosto" was in a position about $23^{\circ} 40'$ N. and $67^{\circ} 30'$ E., say 20 miles from land and 127 miles north of Dwarka.

This position was close to position A, and on it is now concentrated a moon's combination with Uranus—as shown by diagram 150 for February 17th, 3 h. 36 m. G.M.T.



H. M.

February 17th, 3. 36 G.M.T.

Solectric Flow from B to A.

H. M.

Ship's time about 8. 0 p.m.

Ship enveloped in brilliant light.

FIG. 150.

The sun at the same time forms a combination with Saturn and Mercury which crosses at B to the S.E. in about 15° N. and 72° E.

A strong solectric current is now set up between B and A, and the earth endeavours to absorb much of the force.

The result is well described in the following account, described as "Weird experience on a liner," etc.

WEIRD EXPERIENCE ON A LINER, 1912.

"SEA LIKE A BOILING POT"—BUT ONLY IN IMAGINATION.

An account of a most curious experience in the Indian Ocean on February 17th has been forwarded by Captain H. Bradley, commanding the Wilson liner "Ariosto," to the Imperial Merchant Service Guild and to the Indian Government Observatory at Bombay.

The night was clear and cloudless, and the sea smooth, when,

he says, "we steamed into the most curious and weird atmospheric phenomenon it has been my lot to see in all my 40 years' experience of a sea life. As we approached it, it had the appearance of breakers on a low beach, but when we got into it at first it looked like flashes of light (not bright) coming from all directions in quick time. After some few minutes of this the flashes assumed a lengthened shape, following quickly one after the other from the north, and these continued some minutes, steadily veering east and south and south-west into north-west.

"All the time this was going on the surface of the sea appeared to be violently agitated, at times very high seas, as if they would engulf the ship; the imagined waves always going in the same direction as the waves of light.

"The sea appeared like a boiling pot, giving one a most curious feeling, the ship being perfectly still, and expecting her to lurch and roll every instant. It turned me dizzy watching the moving flashes of light, so that I had to close my eyes from time to time. We were steaming in this for 20 minutes, and then passed out of it.

"For 20 minutes everything around assumed its normal condition, a beautiful fine, clear and cloudless night. At the end of this time we again saw the same thing ahead of the ship, and in a few minutes were fairly amongst it again, but if anything slightly worse, the waves of light acting in precisely similar manner, this second lot lasting about 15 minutes, when we again steamed out of it.

"When the flashes passed over the sea appeared just for that instant of time to be full of jelly fish, but I do not think there were any about. I have seen the white water many times in this Arabian sea, but this did not appear like that in any way. It gave one the idea of the cinematograph without the brightness, the flashes being so quick in their movements."

The "Ariosto" arrived at Karachi at 2 h. 30 m. a.m. on February 18th, having passed over position A, where the moon and Uranus were doing their utmost to assist the earth in balancing forces.

The last example is explained at length by the following cutting from the London "Daily Chronicle" of April 22nd, 1916.

HOW NEWS CAME FROM THE "AURORA."

MESSAGE GOT THROUGH UNDER "FREAK" CONDITIONS.

OPERATOR'S NIGHTLY VIGIL.

It will be remembered that the first news of the disaster of the Aurora, the Ross Sea ship of Sir Ernest Shackleton's Trans-Antarctic

Expedition, came by wireless from the ship to New Zealand, and the message was first published in its entirety in "The Daily Chronicle" of March 25th, 1916.

The Wireless Press, Marconi House, has now received a message from Mr. Lionel Alfred Hooke, the operator on the "Aurora," giving an interesting account of his efforts to get into touch with a land station during the months when the ship, caught in the ice, was drifting about in the Antarctic Sea.

One of the greatest puzzles to wireless telegraphists is the peculiar power some signalling stations possess of occasionally transmitting messages over many times the distance for which they were originally intended to operate, and it is now known that the message of March last was only made possible by a "freak" performance on the part of the wireless equipment of the "Aurora."

UNHEARD CALLS.

When the "Aurora" was carried away by the blizzard of May 19th, 1915, Hooke at once endeavoured to get in touch with the marooned party, hoping that they had been able to erect the receiving installation previously landed. On June 1st, basing his hopes on the fleeting possibilities of abnormal loneless conditions, Hooke began to call Australia, but without success.

One reason for this was that the Commonwealth, in the interests of economy, had recalled the staff of the wireless station at Macquarie Island. This removed the first possibility of inter-communication with the little party drifting in the Antarctic ice.

During the long Antarctic winter, after the ship had been crushed in the ice, Hooke overhauled his apparatus and night after night sat in his cabin straining to catch sounds which would tell of the world's knowledge of the ship's fate. Twice in August he heard faint signals, but they were unintelligible.

Not until March 25th, 1916, with a quadruple aerial 80 ft. above deck, did Hooke succeed in obtaining definite signals from stations in Tasmania and New Zealand, 990 miles distant. Then followed the message which startled the globe.

FIVE TIMES NORMAL RANGE.

The message was received by the naval radio station of Williams-town and the radio station at Melbourne when the gallant little ship was distant at least five times more than the normal range of her wireless transmitting equipment.

The "Aurora," trying to get into communication day and night for many months, at last on March 25th, 1916, succeeded in hearing an answer to her signals from New Zealand and Tasmania. The diagram 151 for this date is calculated for 5 h. p.m. Greenwich, when the moon was at extreme declination S. $26^{\circ} 45' 54''$. Solectric energy is always active at this period, and now we have an example on a great scale of what took place on a small scale on February 17th, 1912, as depicted in the last diagram.

In this case the sun, strongly supported by Jupiter and Mars concentrate on an area near 57° S. and 162° E. a powerful positive pressure of Solectric energy.

At this time the moon and three planets are concentrated over position B, 11° N. and 104° E.

This position is thousands of miles away, but distance is no obstacle to a force ranging through the whole solar system.

A rush of current, so to speak, takes place from the sun's terminal in the south to that of the moon in the north, and possibly direct to the moon, at her zenith to the north-east of New Zealand: also the sun and position B were probably in touch as they are nearly on the same meridian.

Under these circumstances the unfortunate "Aurora" has now a streak of luck. The ship is within the area affected by this positive Solectric force; by this calculation she is about 1,000 miles from civilisation and the Solectric receivers. To the surprise of the wireless operator a message now reaches a distance five times further from the ship than the apparatus was designed for.

To the student of Solectrics this is not very surprising, especially when the diagram is studied. Moreover one may now conclude that the word "Wireless" is a misnomer applied to these messages.

In the first place wire antennæ or wires stretched in different directions are always necessary at the projecting and receiving stations.

Secondly, the force used is Solectric force, therefore, the messages should be termed Solectric messages.

In contrast with this case of wireless messages travelling far by means of natural forces, there is the opposite condition of telegraphs and submarine cables refusing to act. When this happens the cause is stated by authority to be a "magnetic storm," and further inquiry would be deemed impertinent or the inquirer would be humbled by being referred to the sun spots.

Solectrics however, can throw some light on the question. On October 31st, 1903, all the cables from Europe to Newfoundland utterly refused to work, except one from Brest to New York. One

cable was destroyed says the "Globe" of November 7th. The storm lasted more than 24 hours and is referred to in the following newspaper cutting from the "Times."

A MAGNETIC STORM.

Considerable delay was occasioned in the working of the submarine cables on Saturday, October 31st, by an exceptional electrical disturbance which is described as the worst for 15 years.

The director of Stonyhurst College Observatory states that the disturbance of telegraph lines between London and Paris was also noted on their instruments and was the greatest since 1867. There were great and rapid changes of horizontal direction and force, greater than the instruments could measure. The storm began at 6 h. a.m. on Saturday and ended at 5 h. a.m. on Sunday, but there were hours of small rapid oscillations at the beginning and ending. The surface of the sun was marked by two spots.

Solelectric calculation makes it clear that the cause of communication becoming interrupted was that the cables, northward of Brest and New York were overwhelmed by negative Solelectric force.

This force fell upon the S.W. of Ireland and was imparted by the sun, moon, Mercury and Venus at a range of $57\frac{1}{2}^{\circ}$. and by Mars to Newfoundland also at $57\frac{1}{2}^{\circ}$.

The cables were cleared and resumed work on October 31st 17 h., at which time the S.W. of Ireland terminus was under the positive Solelectric influence at 88° of the moon and Mars: at the same time the Newfoundland terminus was cleared by the positive influence of Jupiter and Venus acting from 88° .

Again, in 1909, a general electric storm took place affecting all wires in Britain and France. There were electric disturbances in Russia, Australia and the United States with displays of Auroræ.

In England the storm lasted from half an hour before noon on September 25th until 8 h. p.m. The "Daily Mail" of September 27th says:—A great electric storm wide in its effects occurred on Saturday 25th.

Telegraph wires were put out of action by alien currents in England, the Continent and America, while in other parts of the world the electric energy manifested itself in the appearance of "northern lights." This potent but silent storm was the worst that has taken place since October, 1903. The cause of these sudden and irregular electric phenomena is by no means certainly known but there is an evident connection between them and auroral displays and sun spot activity. New York reports a magnetic storm of unprecedented violence. Incandescent resistance lamps glowed weirdly; when the

operators at the telegraph opened the Keys brilliant sparks flashed out. There was a 500 volt alien current coming from an unknown source which broke the circuit.

Greenwich records show that in England the disturbance became serious at about 11 h. 30 m. a.m. September 25th, when rapid oscillations of the recording needle had twenty times the extent of swing observed in moderate disturbances.

Adopting this time, 11 h. 30 m. a.m. for the Solelectric calculation of positions having reference to England, the result shows that the sun and moon were $57\frac{1}{2}^{\circ}$ from each others subzenith positions and the same distance from mid England.

Mercury, Mars, Jupiter and Saturn were also acting over England at that time and were $57\frac{1}{2}^{\circ}$ away. So that the country was charged with negative Solelectric force—as in 1903.

Moreover, when the Solelectric balance was restored at 8 h. p.m. the sun, moon, Jupiter and Mars were all throwing over England positive arcs of 88° , as in 1903.

These cases are enough to clear away the mystery of magnetic storms.

One more natural phenomenon calls for discussion before closing this work and that is the rainbow.

Two very different reasons for the appearance of the beautiful arch of many colours have been advanced and taught.

The first theory was founded on a Hebrew tradition that God placed the bow there that he might look upon it and remember his covenant not to bring a second flood to destroy every living thing. In this age such an explanation is ignored, for surely God needs no reminder not to destroy his creatures.

The second explanation is that advanced by scientific text books to-day, and is based on the refraction of light. We know that light can be broken up into its constituent colours by passing it through a prism, but the manner by which light is transformed into the rainbow is still open to argument. It is stated that the light enters a rain drop and is there refracted and reflected to an observer. But the bow appears as a steady coloured luminosity, not shimmering or twinkling as it would do if caused by moving raindrops. Nor do we always have a rainbow at sunset or at sunrise when a cloud is opposite the sun. Nor, indeed, is a gorgeously coloured sunset the rule, even when the sun and cloud would seem to promise it. Some element is absent. Coloured bows have been seen at night when neither sun nor moon was above the horizon.

Evidently a certain quality and condition of atmosphere is necessary before a huge circle of light can be refracted into its constituent

colours, and it is probable that this quality is produced by the action of other Solectric bodies besides the sun throwing arcs of positive force which inter-mingle in radiance.

In fact rainbows may be Solectric arcs made manifest; and it is not strange that rain or hail should often accompany them because the positive arcs are cold, and chill the air.

There occurred a remarkably vivid semi-circular rainbow at Concepcion, Chile (37 S. and 73 W.) in the year 1900, February 28th. There was an outer bow also, and part of a third innermost one, brighter than the outer one. This bow was caused by the presence of four powerful Solectric bodies. The sun and Mars were acting directly on the district at 88° ; Jupiter was 88° from the sun, and the moon was 88° from Jupiter. The mean time at place was 5 h. 12 m. p.m.

Position of sun $7^\circ 50' \text{ N. } 148^\circ \text{ W.}$ subzen. Jupiter = $21^\circ 4' \text{ N. } 61^\circ \text{ W.}$ nad. Mars = $12^\circ 29' \text{ S. } 157^\circ \text{ W.}$ zen. Moon = $6^\circ 17' \text{ S. } 23^\circ \text{ E.}$ subna.

In 1913, October 11 d. 3 h. 46 m. G.M.T., I noted another brilliant rainbow in the Isle of Wight. The sun, Jupiter and Mars were 88° from observers position at that time.

Sun = $6^\circ 58' \text{ S. } 59\frac{1}{2}^\circ \text{ W.}$ zen. Jupiter = $23^\circ 20' \text{ S. } 25^\circ \text{ E.}$ zen. Mars = $23^\circ 24' \text{ S. } 28^\circ \text{ E.}$ nadir.

By referring to the diagram for the great explosion at Senghenydd colliery, South Wales, October 14th, it will be seen that the above three Solectric elements caused the loss of over 400 men.

As if to confirm the contention that a rain cloud is used as a screen upon which the picture of refracted Solectric force is thrown and is thus made visible, the following letter is of interest. The moon was 144° E. at the time of observation and far from Leigh at the mouth of the Thames.

Mr. Patterson describes the bow as a complete arch of peculiar light seen at half past midnight of November 15th, 1914.

A NIGHT-TIME RAINBOW.

To the Editor "Daily Chronicle."

SIR,—Perhaps one of your readers may be able to explain a peculiar arch of light in the sky on the night of Sunday last, the 15th. It was, as near as the eye could measure, of the same size as a rainbow. The centre of the arch bore nor'-nor'-west from here; it was rather dim, yet formed so perfectly that another person and I saw it distinctly from horizon to horizon—that is, unlike most rainbows, it was a complete arch, of a moony hue. The time was 12.30 and rain was falling at intervals. Although I have gone through some

thousands of night-watches, I have never before seen this phenomenon. The only approach to it that I recollect were "moon dogs," after thunderstorms in the tropics ; but they only appeared when the moon was near her full, and were much the same as "sun-dogs" after rain-storms by day. But in this instance there was no moon. I looked for the phenomenon again last night ; but it was not visible, neither were there clouds or rain.

J. E. PATTERSON.

Leigh-on-Sea, Nov. 17, 1914.

Solelectric calculation shows that at the time of observation Jupiter and Saturn had their beams of 88° crossed over Leigh-on-Sea and vicinity. The sun was in touch with Jupiter also at 88° . The illuminated arch showed that a great intensity of force was making itself manifest.

Position of sun at time of observation $18\frac{1}{2}^\circ$ N. 11° W. nadir. Jupiter = $17^\circ 20'$ N. $75^\circ\frac{3}{4}$ E. nadir. Saturn = $22^\circ 15'$ S. 30° E. subzen.

In fact fiery writing of this nature in the heavens tells of the concentration of Solelectric forces of high voltage, and it seems to the writer not to presage fine weather. Considering the large volume of force ever circulating over and through the surface of our globe, and that at intervals a Solelectric combination may suddenly increase both the current and voltage immensely, it seems imprudent to use electric lighting in munition factories, or on war ships stored with explosives.

The factory should be illuminated from a central dome having all wires outside. Hooking a battleship to the charged earth by anchor and a few feet of iron cable must be dangerous at times.

As this work is passing through the press news has been received from Baghdad telling of the great heat experienced there by the British Army. The diagram on next page gives a simple explanation and is of itself a proof of the solelectric theory.

From Edmund Candler, Correspondent of the "Daily Mail":—

BAGHDAD, Sat., Sept. 15, 1917.

"In Mesopotamia 1917 has been the hottest season of which record exists. Baghdadis say they do not remember a worse summer, and at Bussorah, owing to the moisture of the air and the south winds, the conditions have been even more trying. The highest temperature reading at Baghdad was 122.8 on July 20."

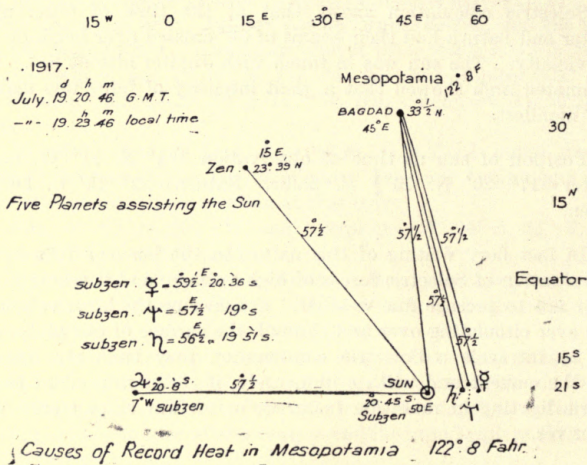


Diagram referred to on page 211.

CONCLUSION.

In conclusion it may be remarked that during many centuries it has been believed that the sun and planets had a direct influence on the earth and all mankind. The Latins had a saying: *Astra regunt homines, sed regit astra Deus*. The stars govern men, but God governs the stars. In Shakespeare's "King Lear," Gloster says: "These late eclipses of Sun and Moon portend no good to us"; and Edmund speaks of an enforced obedience of planetary influence; and of a prediction which should follow these eclipses.

In this book we have learned how greatly every member of the Solar family can influence its neighbours, and how the sun rules all. Astronomy was not exact enough in old times to permit of such calculations as are necessary to prove the intensity and interaction of the Solectric forces which connect together the members of the Solar system.

We are very far from knowing all the influences which affect our thoughts and health.

Yet we know that people are more cheery in the sunshine than in black fog, and that sunlight kills enemy microbes.

We are children of the sun, for without sun there would be no life, and without life there can be no intelligence.

The world is very beautiful—in some places; and most people have been very happy—sometimes.

The veil has been lifted, as it were, to show us what might be.

There is but one course to pursue on this planet in order to qualify for the next, and that is to *Justify* our *Existence* here, by useful work, by defrauding none, and by never causing the innocent to weep.

CONTENTS.

	PAGE.
The Solectric Theory	1
Explanation	16
Waterspouts	27
Tempests	35
Earthquakes	62
Volcanoes	89
Explosions in Coal Mines	116
Explosions in Warships	130
Meteors, &c.	158
Rollers	175
Heat and Cold Waves	180
Asylums	194
Other Phenomena	203

Telegrams, "Potter, Minories, London."

J. D. POTTER,

ADMIRALTY AGENT FOR CHARTS,

AND

PUBLISHER OF NAUTICAL WORKS.

145. MINORIES,

LONDON, E. 1.

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ALTERATION IN SYSTEM OF DATING CHARTS FOR CORRECTIONS.

Date of alteration.—Notices dated 1st May 1918.

The existing system of dating Admiralty charts for Admiralty Notices to Mariners is to be superseded by the following :—

When a chart is corrected for an Admiralty Notice to Mariners, the year and the number of the Notice is to be inserted in the bottom left-hand corner of the chart, thus:—1918—2, 17, 46, etc.

Remarks—Charts which have been cancelled for any cause other than the issue of a new edition, will carry in the bottom left-hand corner in brackets the date of such cancelling, thus:—

1918—2, 17, 46 (X. 21) 50, 62, etc. ; 1919—(I. 26). 40, 72, etc.

Notations enclosed in square lines thus : 6.18 are references for use at the Admiralty only.

NOTE.—For the latest information respecting alteration of system for corrections on the Admiralty Charts, reference should be made to the Sailing Directions (Pilot Books) under the heading of "GENERAL NAVIGATION," following the Contents of the volume; also to the Current Monthly Notices under the heading of "GENERAL NOTICES" issued by the Board of Trade, Mercantile Marine Department.

REPORT OF PROCEEDINGS of the International Hydrographic Conference London, June, 1919 (published by His Majesty's Stationery Office, 1920) when Fifty-one Delegates representing Twenty-five States attended in General Meeting at the invitation of the British Government. This Report will be found most interesting reading to the Nautical profession. It contains over two hundred pages of evidence and reports dealing with the examination of many questions of practical and scientific interest in connection with navigation and marine survey, and is a comprehensive summary of the proceedings of one of the most important international conferences held for the purpose of improving the hydrographic services of the Governments of the Maritime States. ... 10.6

The International Hydrographic Bureau entered upon its functions in July 1921.

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(Published by the Hydrographic Department)

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ADMIRALTY CHARTS

(Published by the Hydrographic Department)

Probably there are but few persons connected with the Nautical World who have not heard of the Hydrographic Department of the Admiralty. A large number, however, must naturally be unaware of the immense amount of work done by the Officers associated with this vast but unpretentious establishment:—vast on account of the wide scope of its operations, unpretentious by reason of the quiet and business-like way in which the whole of its important duties are carried out. On the second floor of the new building in Whitehall, known as the Admiralty, are to be found the Officers who painstakingly inform “those who go down to the sea in ships” where they can navigate their vessels in safety, and where they cannot do so.

It appears from the “Encyclopædia Britannica” that nautical (loxodromic or compass) maps made their first appearance in Italy in the 13th century, the oldest which has been preserved coming from Pisa, and belonging to the middle of that century, and when the loxodromic maps came into existence, handbooks with sailing directions accompanied them. In England the word “map” became applicable only to a land map, and the sea map became known as a “chart.” As early as the 14th century this expression appears to have been used to distinguish a sea map, but it is stated it did not become general till the 16th century. In 1583 one Lucas Janszoon Waghenaeer, of Enkhuyzen, who belonged to the School of Mercator, became the founder of nautical map collections. In Holland a Cartographer to the States-General was appointed in 1633, and it was his duty to examine the ships’ logs and so amend the maps.

Prior to 1795 the Royal Navy of England and its Mercantile Marine were dependent for their supplies of charts and sailing directions, upon surveys made by Captains Cook, Lane, Gould, Hurd (afterwards Hydrographer), Vancouver (one of Cook’s best lieutenants), Flinders, and Mackenzie. Up to about 1790 the surveys made appear to have been of a semi-official character notwithstanding the fact that those engaged in the work were employed and paid by the Admiralty.

By an Order in Council in the year 1795, a Hydrographical Office was established, and a Hydrographer appointed, whose duties, as defined by the said Order were “to take charge and custody of such plans and charts as then were, or should thereafter be, deposited in the Admiralty, and to select and compile such information as might appear to be requisite for the purpose of improving navigation.”

The gentleman selected by Earl Spencer in 1795 for the post of first Hydrographer was Mr. Alexander Dalrymple, an officer in the East India Company’s Service.

In 1786 the Catalogue of that Company comprised 347 Charts between England, the Cape, India, and China.

Mr. Dalrymple commenced his official duties at the Admiralty with one assistant and a draughtsman.

It may be interesting to give the Staff of Officers at present engaged in this Department at Whitehall and Cricklewood:—

The Hydrographer, Assistant Hydrographer, Chief Civil Assistant, Superintendent of Charts, Assistant Superintendent of Charts, Superintendent of Sailing directions, Superintendent of Tidal Work, twelve Naval Assistants to the Hydrographer, Director of Navigation and four Assistants, Superintendent at Chart Establishment, Cricklewood, twenty Cartographers, Civil Staff Officers, Second Division Clerks, Assistant Clerks, Draughtsmen, Women Clerks and others; total exceeds One Hundred and Fifty Officials.

The valuable work performed by the Hydrographic Department of the Admiralty may be gleaned from a perusal of the Report made by the Hydrographer, and published yearly in October.

In 1921 there were nine Surveying Ships and various Dockyard Launches employed in Hydrographical surveys in many parts of the Globe. The number of officers and men engaged being one thousand and two.

During the eleven years 1911-1921 no fewer than four thousand five hundred and ninety seven rocks and shoals dangerous to navigation were reported.

The general public have little knowledge in regard to the system upon which not only the Admiralty Charts are compiled and distributed, but kept up-to date. A chart is in one sense never complete and the work of the Hydrographer can never attain finality. The earth that is beneath the waters is plastic and shifting. Shoals and rocks are thrown up or disappear. the tearing currents cut continually new paths for their inconstant passage, no coast the world over has entire permanence of outline. These tasks of a science invaluable to human intercourse deserve to be more fully understood and appreciated.

It is essential that every chart issued under the authority of the Admiralty should be absolutely correct at the date on which it is sold, so far as the information to hand up to that date permits. The primary function of the surveying service and the Hydrographic Office is to compile and issue charts for the use of His Majesty's ships, but those in authority are fully alive to the fact that correct charts are a *sine qua non* for the merchant service, and that the merchant service is not in a position to supply itself with such charts. The Admiralty, accordingly appointed an Agent, whose duty it is to sell all Charts, Sailing Directions, Light Lists, and other publications issued by the Hydrographic Office.† In addition, there are numerous Sub-Agencies in all the principal Home and Foreign Ports where these Publications are always to be obtained.

The Admiralty Charts are used not only on board almost every vessel of the British mercantile marine, but in the Navies of many foreign countries and nearly all the merchant vessels of the world, whatever flag they may fly. The work of the Surveying Department of the Navy, whether on board the vessels specially detailed for surveying duties or in the Hydrographic Office at the Admiralty, is accordingly, work of very considerable importance.

There are already published over three thousand nine hundred charts; and this number is being added to by new charts at the rate of about fifty each year. In 1830 the first official Catalogue of Charts was issued, and the total number of Charts then catalogued was 962.

From the figures shown on page 23 some idea may be formed of the extent of the work done by this Department, and the very large increase which has taken place in it.

A writer in the *Nautical Magazine*, Sept. 1921, remarks—In forty years the number (charts) has increased more than tenfold, and within the last eight years have more than doubled. One Government Department at least would seem to have ample justification for such an expansion in the numbers of its staff as has taken place in recent years.

Tide Tables, Light Lists, Wireless Signals, Distance Tables, and Books of Sailing Directions have been issued for every sea. These publications are in very great request by the Mercantile Marine and Foreign Naval Powers, and many thousands of copies are yearly required to meet these demands. The British Admiralty, of course, retaining large quantities for the needs of the Royal Navy.

The Notices to Mariners issued by the Hydrographer in the year 1885 amounted to 243. Ten years later the figures had grown to 738 of such Notices; for the year 1905, 1,392 were necessary and in 1919 there were 2,311 issued.

† J. D. POTTER, 145, Minorities, London E. 1.

List of Nautical Works published by J. D. POTTER.

ALTITUDE TABLES.

Computed for Intervals of Four Minutes between the Parallels of Latitude 31° and 60° and Parallels of Declination 0° and 24°, designed for the Determination of the Position Line at all Hour Angles without Logarithmic Computation, by Frederick Ball, M.A. (late Scholar of Exeter College, Oxford), Chaplain and Naval Instructor in His Majesty's Fleet	s. d.
Ditto, ditto, between the Parallels of Latitude 0 and 30° and Parallels of Declination 0° and 24°	18 0
Ditto, ditto, between the Parallels of Latitude 24° and 60° and Parallels of Declination 24° and 60°	18 0

These Tables are so arranged for working by the New Navigation that only one correction has to be applied to the altitude taken direct from the book. The entire logarithmic work is replaced by a single subtraction and the application of the correction. In conjunction with the Nautical Almanac all the usual problems of Navigation are solved.

Amongst others the time of Sunrise, the Altitude Azimuth, Course and Distance on Great Circle, etc.

(The Tables have been adopted for use in the Japanese Navy.)

Alt-Azimuth Tables. Latitude limits 30° to 64°. Declination limits 0° to 24° prepared for the Admiralty by Percy L. H. Davis (published by His Majesty's Stationery Office, 1918)	20 0
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Code Name. DAVIS A.

Alt-Azimuth Tables. Latitude limits 0° to 30°. Declination limits 0° to 24° prepared for the Admiralty by Percy L. H. Davis (1921)	20 0
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(Supplied to H.M. Fleet by Admiralty order.)

Published by J. D. POTTER.

Code Name. DAVIS B.

Alt-Azimuth Tables. Latitude limits 30° to 64°. Declination limits 23° to 64° published by Imray, Laurie, Norie & Wilson Ltd. (1922)	20 0
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Code Name. DAVIS C.

Code Name. DAVIS D.

Lat. 0° to 30°, Dec. 24° to 64°.

(In preparation.)

The "Newest" Navigation and Aviation Altitude and Azimuth Tables. The simplest and readiest in solution by Commander Radler de Aquino, Brazilian Navy. The 3rd electrotyped edition, enlarged and further improved (Brazilian Centenary edition, 1924). All sights for position are worked out by the same method <i>without logarithms</i> , with hardly any calculation. All the other problems in navigation are easily and rapidly solved by inspection without interpolation. This work has received the favourable endorsement of the United States Hydrographic Office	20 0
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New Log and Versine Altitude Tables (Reprinted from the 2nd Edition of above Book), by Lieut. Radler de Aquino (Brazilian Navy). The simplest and readiest way of finding the Altitude by means of <i>logarithms</i>	2 6
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List of Nautical Works published by J. D. POTTER.

- A New Altitude-Azimuth-Hour-Angle Chart.** This new invention does a. d.
for the Altitude-Azimuth problem what the well known Weir diagram accomplishes for
the Time-Azimuth method 2 6

By means of a simple chart, or diagram, which represents a square, with sides divided according to the values of the Natural Haversine, the Altitude Azimuth is solved by merely drawing a straight line. Or again with the same data, latitude, declination and altitude, an approximate value may be found for Hour Angle. It is anticipated that the diagram, the invention of which is due to Mr. W. G. Littlehales, of the U. S. Hydrographic Department, will prove of great service in the Navigation of the Air.

- Aquino's Protractor Diagram.** A very remarkable development of the
use of squared paper for chart work, as simple as it is ingenious. Issued in
blocks of 100 8 0

This diagram offers the simplest possible method of laying off position lines. The work is done more quickly, and more accurately, and the use of a protractor is dispensed with.

DOUBLE ALTITUDES.

- A Method for finding the Latitude by the Simultaneous Altitudes
of Two Stars, by Capt. Burdwood, R.N. (reprinted 1896)** 1 0

COOKERY.

- Ship's Cook and Steward's Guide, containing Hints for Management, and Two
Hundred and Fifty Recipes, by James B. Wilson** 1 0

TIME AZIMUTH TABLES.

- Sun's True Bearing or Azimuth Tables, by John E. Davis (Staff
Commander, R.N. of the Hydrographic Department, Admiralty).** The **REVISED**
Edition of the above, with Extensions in Declination and Hour-Angle, has
been prepared by *Percy L. H. Davis, F.R.A.S., Chief Assistant (retired) in H.M.
Nautical Almanac Office.* 20 0

In this completed edition of the older book, azimuths are given from the horizon to the meridian, an improvement rendered necessary by the very general use of the Marcq St. Hilaire method.

Code Name. DAVIS 1.

- Sun's True Bearing or Azimuth Tables, by John
Burdwood, (Staff Commander, R.N., of the Hydrographic Department,
Admiralty.)** The **Revised** Edition of the above, with Extensions
in Latitude, Declination and Hour-Angle, has been prepared,
with the permission of H.M. Stationery Office, by *Percy L. H.
Davis, F.R.A.S., Chief Assistant (retired) in H.M. Nautical
Almanac Office* 20 0

Code Name. DAVIS 2.

- Davis's Supplementary Azimuth Tables** (now published separately). The
Time Azimuth Tables in general use do not often give azimuths near the
meridian, which are in frequent demand for ex-meridian observations, but they
will be found in this book, in addition to complete tables extending to latitude 64° 10 0
(Supplied to H.M. Fleet by Admiralty order)

- Davis's Star Azimuth Tables, computed for all latitudes between 60° North
and 60° South, by P. L. H. Davis.** This book has followed on the very general
adoption of stellar observations as a means of navigation, and supplies the seaman
with the same details regarding stars, as he can get from "Burdwood and Davis"
when the sun is concerned. Some ingenious altitude marks are used for the
first time in these tables which materially aid in the identification of any hastily
observed star, as to which doubt may exist 20 0
(Supplied to H.M. Fleet by Admiralty order.)

List of Nautical Works published by J. D. POTTER.

High Latitude Tables, between 61° and 78° . By *Percy L. H. Davis* 10 0

This work, which was originally prepared for and used by the Antarctic Expedition of 1901, has now been adopted for use in H.M. Navy and will certainly be a necessity in all ships trading to northern ports.

(Supplied to H.M. Fleet by Admiralty order.)

A complete set of the above Tables, dealing as they do with all declinations up to 64° , and with practically all navigable latitudes, have the effect of rendering the Time Azimuth, considered as a logarithmic problem, obsolete. The extensions of the Azimuth Tables effected by Mr. Davis have a second important result, that they render the solution of the problem of finding Course upon a Great Circle perfectly general, so that such a course is now more easily determined than the ordinary Mercator Course. For examples see footnote to page 136 of Raper's Practice of Navigation (1920 edition.)

Short, Accurate, and Comprehensive Altitude-Azimuth Tables to show the true bearing of the Sun, Moon, Planets, &c., for latitude 0° to 75° north or south; altitudes 0° to 75° ; and declination 30° north to 30° south; also the Approximate Ship Time, by *A. C. Johnson, R.N.* (Published by request) 5 0

(Supplied to H.M. Fleet by Admiralty order.)

Captain Weir's Azimuth Diagram 1 6

(Supplied to H.M. Fleet by Admiralty order.)

Time Azimuth Diagram, by *Hugh Godfray M.A.* 3 6

CHARTS.

Charts: their use and meaning, with thirteen figures and eight charts, by *Dr. G. Herbert Fowler* 4 0

This, which is believed to be the first book on charts yet published, brings together information which hitherto has been obtainable only from verbal teaching. It deals with Mercator and Gnomonic navigational charts, and with Meteorological and other scientific charts, from a practical point of view in simple language.

CHRONOMETER TABLES.

Davis's "Chronometer" Tables; or, hour angles for selected altitudes between latitudes 0° and 50° , with variations for $1'$ in all elements, by *P. L. H. Davis*. Means of working a Sun "Chronometer" arithmetically have been for many years a desideratum, and have been published, in 1793, by Lalande; in 1827, by Lynn; and by Hommey, in 1863; but Mr. Davis, by the omission of useless or undesirable altitudes, and the inclusion of Variations in $1'$ of Altitude, Latitude and Declination, has made a table of great practical utility. The book, as a substitute for or a check on logarithmic calculation, is almost a necessity, and is especially useful in latitudes less than 45° . A comparison has been made in actual work of the tabular results with those obtained in the ordinary way, showing practically identical results 20 0

The general adoption of the Position Line methods has added greatly to the advantage gained by this method of finding hour angle by simple arithmetic, for the following reasons. By working with the whole degree of latitude nearest to the latitude by account we dispense with the correction for latitude altogether, thus saving one third of the work. If in addition to this we make the observation upon a complete degree of altitude, as is generally possible in moderately fine weather, a second calculation is eliminated, and by means of the "variations" alluded to above the hour angle is found with no more trouble than is presented by the correction of an element from the Nautical Almanac. Captain Hommey who, as already mentioned, published a set of Chronometer Tables in 1863, strongly recommended the use of an exact degree of altitude in connection with the Tables.

Notes on the Management of Chronometers and the Measurement of Meridian Distances, by *Rear-Admiral Charles Shadwell, F.R.S.* (1861) 4 6

EQUAL ALTITUDES.

Tables for Facilitating the Method of Equal Altitudes, by *F. A. L. Kitchin, B.A., Naval Instructor, R.N.* 1 0

List of Nautical Works published by J. D. POTTER.

COMPASS.

Rev. William Hall's Visible Astronomical Compass, for Lat. 50. s. d.
Channel and adjacent zone. Important for sea and air navigation, size, 6in.
diameter 1 0

An Explanation of the Adjustment of Ships' Compasses, illustrated with
numerous diagrams, by *Captain the Honourable Wentworth Cheswood, R.N.* ... 2 0

The work consists of a reproduction of a course of lectures delivered by the author at the Royal Naval College Greenwich in the year 1904, and the manner in which a clear and comprehensive view of the whole subject is compressed within the limits of a small volume is not a little remarkable. One great charm of the work is its originality, and another is the evident desire apparent throughout not to be content with stating a fact, but whenever possible to find a reason for it. However wide a student's reading may have been in this somewhat thorny subject he will find in this little volume matter for fresh reflection.

Handbook to Beall's Compass Deviascope, by *Captain George Beall.*
contains, in addition to a complete explanation of this well-known instrument,
much information necessary to compass correction ... (4th Edition) 1 6

No one man probably has done so much to disseminate a sound knowledge of the mysteries of compass correction as has been accomplished by Captain Beall by means of his great invention. In this little handbook are described the various uses to which the Deviascope can be directed, together with a large amount of general information upon the subject of compass correction generally.

ADJUSTMENT OF COMPASSES.

Elementary Manual for the Deviations of the Compass in Iron Ships, intended for the use of Seamen of the Royal Navy and Mercantile Marine,
and Navigation Schools, by *E. W. Creak, C.B., F.R.S., retired Captain, R.N.* ... 10 0

Every seaman is familiar with the official "Admiralty Manual for the Deviations of the Compass." The first edition of this work was issued as far back as 1862, and the technical portion was largely based on the researches of a distinguished Mathematician, the late Archibald Smith. The mathematical character of the contents, however, placed the volume to a great extent beyond the comprehension of the ordinary navigator, and later on an "Elementary Manual" was issued. It fell to the lot of Captain Creak, in the course of his official duties in the Compass Department at Whitehall to recast this useful work, "both in the manner of presenting its subject to seamen, and in the arrangement of its parts." In its present form the treatment of the Deviation is distinctly simpler, and while the larger portion of the book is quite intelligible to the beginner, at the same time the volume includes all the information that the more advanced student is likely to require.

Practical Information on the Deviation of the Compass, for the use of
Masters and Mates of Iron Ships, by *J. T. Towson, F.R.G.S.* ...
AND
Supplement to the above; being the Questions on the Deviation of the Compass
issued by the Board of Trade for the Examination for Masters' and Extra Masters'
Certificates, and Answers to the Questions, by *Capt. William Mayes, R.N.* ... 4 0

The Roxburgh Compass Error Card. For quickly and accurately correcting
True and Compass Courses and Bearings by a New Method; extremely simple and
easy to work. Size 10 x 11 inches, printed in black and red; varnished. By
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Compass by both methods, and the Corrections applied, by *Capt. A. B. Becher, R.N.* 1 0

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explanation of the Hurricane Theory, by *Capt. A. B. Becher, R.N.,* illustrated with
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Plain Deviation Curve Diagram, by *Captain J. C. Robinson* 0 6

GREAT CIRCLE SAILING.

A Chart of South Latitudes, beyond 20 degrees, to facilitate the practice of Great
Circle Sailing; with an accompanying diagram for the determination of the
courses and distances, by *Hugh Godfray, M.A.* 3 0

List of Nautical Works published by J. D. POTTER.

LATITUDE BY EX-MERIDIAN TABLES.

Davis's Ex-Meridian Tables and Supplementary Azimuths, by P. L. H. a. d. Davis. This important work contains Calculated Reductions to the Meridian for hour angles less than 75^m and altitudes lower than 84° , Declinations and Latitudes 34° and 64° N. and S. The use of the book is quite easy to anyone familiar with the Azimuth Tables. The Supplementary Azimuths, which accompany it, give bearings too near the meridian for inclusion in "Burdwood and Davis," which are now in great request for position lines and ex-meridian work ... 20 0

Amongst the great number of Ex-Meridian Tables that have been submitted to the public in recent years the Davis Tables occupy quite a unique position, for the following reason. The ordinary procedure is to obtain from an approximate formula the main correction and if an accurate solution is desired, to refer to a Second Difference Table for a supplementary quantity. The Davis Tables however are deduced from a rigorous formula of Spherical Trigonometry, which supplies the whole correction at once, with practically the same accuracy as would result from logarithmic calculations. The fact that the Reductions may be employed with equal facility in the application of the Marcq position line methods adds materially to the value of the work, while the "Supplementary Azimuths," bound up with the Reductions, offer the great convenience of obtaining Reduction and Azimuth from the same volume.

Tables for the Reduction of Ex-Meridian Altitudes, by J. T. Towson, F.R.G.S. 1 0

Ex-Meridian Diagram, by F. A. L. Kitchin, B.A., Naval Instructor, R.N. ... 1 0

HOOR ANGLES.

See Davis "Chronometer Tables," page 10.

HYDROGRAPHICAL ENGINEERING.

An Essay on Hydrographical Engineering, as applicable to Floating Sea Barriers, Harbours, Batteries, Coast Defences, and Naval Fortifications, by Capt. Auderly Sleigh, K.T.S., F.R.S.L. (with Illustrations), (1859) ... 10 0

INTERPOLATION.

Notes on Interpolation, Mathematical and Practical, by Rear-Admiral C. Shadwell F.R.S. ... 2 0

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On Finding the Latitude and Longitude in Cloudy Weather and at other Times, by A. C. Johnson, R.N. Enlarged to 56 pages, with Appendix and Part II. ... 6 0

Short Tables and Rules for finding Latitude and Longitude, by Single and Double Altitudes, Pole Star, Lunars, &c., by A. C. Johnson, R.N. ... 3 0

Scales of Latitude from 5° to 60° proportional to a scale of Longitude, where $\frac{1}{2}$ in. = one mile, arranged to facilitate the finding of position from two Sumner lines, by R. E. Peake, A.M.I.C.E. ... per set 5 0

Tables showing the Length in Feet of a Degree, Minute, and Second of Latitude and Longitude, with the corresponding number of Statute Miles in each Degree of Latitude; and the number of Minutes of Latitude or Nautical Miles contained in a Degree of Longitude, under each Parallel of Latitude, by R. C. Carrington, F.R.G.S. (1868) ... 1 0

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Handbook on the Law and Practice relating to Apprentices to the Mercantile Marine Service, by F. W. Gardner (of the Middle Temple) ... 1 6

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LUNARS.

Notes on the Reduction of Lunar Observations, Mathematical and Practical, by <i>Rear Admiral C. Shadwell, F.R.S.</i> (1881)	4	6
<i>See also Latitude and Longitude.</i>		

LOGARITHMS.

Davis's Requisite Tables (Logarithmic), by <i>P. L. H. Davis</i> Tables of Logarithms to five places of decimals only, for practical sea work. The typography and arrangement of the book will render it suitable for habitual use, and it contains a table of Logarithmic and Natural Haversines specially designed for modern navigation	12	6
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Tables of Mast-Head Angles, for five feet intervals, from 30 to 280 feet, and varying distances from a cable's length to four miles, with their application to Nautical Surveying; also the determination of distance by sound, with an example... ..	2	0
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MEASURES.

Foreign Measures and their English Values, compiled from Official Sources, by <i>R. C. Carrington, F.R.G.S.</i> (1864)	7	6
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MERCANTILE MARINE.

A Voice from the Quarter-Deck on the State of our Mercantile Marine, by <i>Joseph Mayne</i> (Master Mariner) (1876)	1	0
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Solectrics; a theory explaining the causes of Tempests, Seismic and Volcanic Disturbances, and how to calculate their time and place. Illustrated by over 150 diagrams, by <i>Alfred J. Cooper, Navigator.</i> (Second Edition)	6	0
The Causes of Weather and Earthquakes (with four Diagrams), by <i>Alfred J. Cooper</i> (1902)	2	0

These works relate to a subject which is still in its infancy, but of which more will undoubtedly be heard in years to come. The remarkable manner in which definite forecasts of the author have been fulfilled from time to time cannot be ascribed to mere coincidence, and the books have aroused considerable interest, not only amongst nautical men, but with the general public also.

Light as a Motive Power, a Series of Meteorological Essays (1875), by <i>Lieut. R. H. Armit, R.N.</i>	15	0
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See also Winds.

List of Nautical Works published by J. D. POTTER.

REVERSIBLE TRANSIT INSTRUMENT.

s. d.

- Notes on the use of the Portable Reversible Transit, and the Method of Calculation of the Observations, with diagrams and photographs, by Capt. C. E. Monro, R.N.** ... 3 0

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- Chart of the Navy of Great Britain, from the Earliest Period of History, compiled from Historical publications, old records, Parliamentary returns, and other authorities, by Frederick Perigal (of the Admiralty), 1860** ... 3 6

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- The Alpha, Beta, Gamma Navigation Tables, solving all the problems used in fixing position lines by rules derived from a single formula of Spherical Trigonometry, by H. B. Goodwin, M.A., F.R.A.S.** ... 8 0
- An Equatorial Azimuth Table, a simple and universal method of finding the Azimuth, either by Time or Altitude Azimuth, applicable in all latitudes to bodies of any Declination North or South, by H. B. Goodwin, R.N.** ... 10 0
- The "Conway" Manual of Navigation.** In this book of 80 pages nothing is taken for granted. All formulas are proved and the dependence of Navigation and Nautical Astronomy upon the solution of Plane and Spherical Triangles is clearly brought out. Particular emphasis has been laid upon method. By J. Morgan, M.A. (Senior Master) and T P. Marchant, A. L. Wood (Navigation Masters), H.M.S. "Conway" School Ship ... 5 0

Such a compilation as this, by men of great experience in the teaching of nautical subjects for use on board the "Conway," should be very useful to candidates preparing for the Board of Trade examinations, who have not had the advantage of the "Conway" preliminary training.

- The Practice of Navigation and Nautical Astronomy, complete with tables, by Lieut. Raper, R.N.** ... (See also the "New" Navigation) 30 0
- Nautical Tables, by Lieut. Raper, R.N.** ... (do., do.) 21 0

In the 21st edition of this renowned work, published during the year 1920, various Tables have been added, to bring the work up to the standard of modern requirements.

TRAVERSE TABLES.

- Traverse Tables** (from Raper's Navigation) now issued as a separate publication Table I (92 pages) contains the Diff., Lat. and Dep. for the Course at every degree, and for each mile of distance to 600 miles, with the time corresponding to each degree 2 6

List of Nautical Works published by J. D. POTTER.

Lectures on Elementary Navigation, by *Rev. J. B. Harbord, M.A. (Retired a. d. Naval Instructor, R.N.; late Inspector of Naval Schools, Admiralty; Examiner in Navigation and Nautical Astronomy for the Department of Science and Art; Author of "Glossary of Navigation")* 7 6

Navigation Simplified, by a System of Teaching based on First Principles, for Officers (from 2nd Mate to Extra Master) in the Mercantile Marine and Yachtsmen. Illustrated by numerous diagrams, by *Captain P. Thompson, F.R.A.S., Younger Brother of the Trinity House, Senior Examiner of Masters and Mates, and Secretary to the Local Marine Board of London* 12 0

Examination Diagrams Simplified, for Navigation Students; illustrated by sixteen diagrams (including $5\frac{1}{2}$ inch Boxwood Scale), by *Captain P. Thompson, F.R.A.S.* 2 6

Navigation and Nautical Astronomy up to the standard of the Board of Trade Examination for Second Mate, intended for self instruction, by *William Rey*; revised, extended and brought up to the requirements of the latest syllabus by *H. B. Goodwin, M.A., F.R.A.S.* (formerly Examiner in Navigation, &c. under H.M. Board of Education) 5 0

Practical Coastal Navigation, with numerous charts and diagrams, by *Count de Miremont*, 2nd Edition 4 0

The book is a reprint of a series of papers brought out in the **YACHTING AND BOATING MONTHLY MAGAZINE**, and is specially intended to meet the requirements of yachtsmen, ambitious to navigate their own vessels. Including as it does the Longitude by Chronometer, the Time Azimuth solved by Tables, etc., with many useful hints on Navigation in Fog, and other matters, it has appealed to a wider circle of readers.

Errors of the Four Point Bearing—and other Fixes dependent upon two Bearings of a single Object with the Run of Ship between them, and the Remedy (Several Diagrams), by *Capt. R. E. Carey* 3 0

This little work has a double object (1) to draw the attention of mariners to the danger attending the use of the Four Point Bearing method without making due allowance for current, and (2) to explain the details of an invention of the author designed to facilitate the application of the necessary correction.

Tables of Allowance for Current when affecting Compass Course and Ship's Speed, by *Capt. G. E. Hoar, War Department Fleet*. A small and convenient Table to give by inspection the correction to a Compass Course made necessary by a Current in any direction, and the resulting distance made good. A desirable book for all Coastwise Navigation 2 0

Every prudent navigator, in determining the course to be steered to make a given point, will naturally take into account the effect of any known current, but the allowance made in general is a matter of guess work. Captain Hoar's little work enables the correction to be made with precision. For each knot of ship's speed, from 3 to 30 knots, for each half knot of rate of current up to 8 knots, and for each 10° of angular direction between set of current and course to be made good, the Tables furnish to the decimal of a degree the allowance to be made. A supplementary column gives the distance made good per hour.

The "Hydra" Course Calculator. This diagram provides a quick and handy means of finding the allowance which must be made for the set of the current in order to find the course to steer to reach any desired position; in the case of aircraft the similar allowance which must be made for the drift due to the wind, can also be found. Price (with 12 pp. Booklet) 3 0

The "Hydra" Calculator is similar in its general object to Capt. Hoar's Tables, but is specially adapted also to solve various problems of the same nature as the current problems, that arise in Air Navigation.

List of Nautical Works published by J. D. POTTER.

"THE 'NEW' NAVIGATION."

- Appendix to Raper's Practice of Navigation.** Being an explanation of the New Astronomical Navigation by the method of Calculated Zenith Distances, with Special Tables for Simplifying and Shortening the work, by *William Hall, R.N., F.R.A.S., Chaplain and Naval Instructor (Chief Naval Instructor, Royal Australian Navy)* 2 6

A special feature of Mr. Hall's work is the Table of combined Natural and Logarithmic Versines. By means of combined Tables of this nature a great saving of labour is effected in various problems of Navigation. A further saving is obtained by giving values to four places of decimals only. It is gradually coming to be recognized that this number of places offers a degree of accuracy quite sufficient for all ordinary purposes.

NAUTICAL AND GEODETIC ASTRONOMY.

- Nautical Astronomy,** by *W. P. Symonds (Ex-Commissioner of Surveys)*. The best methods of calculating Hour-Angle, and finding Longitude and Latitude. The shortest Ex-Meridian method with New Table. Sidereal and Mean Time made clear. The New Navigation explained and the Modern methods of working Double Altitudes, and drawing Position lines. The Equation of Equal Altitudes made easy, and used for finding Longitude from Ex-Meridians, and for determining error in Latitude due to Ship moving N. or S. Lunars simplified. Chapters on finding Distances, the Tides, &c., with many diagrams 6 0

- Nautical Astronomy Made Easy,** by *A. C. Johnson, R.N.* All the Rules being worked by a Small Table on One Page, designed to economise Time and Labour ... 3 0

- An Introduction to the Practice of Navigation and Nautical Astronomy,** by *R. E. Hoopell, M.A., F.R.A.S.* 3 6

- Handy Methods of Geodetic Astronomy for Land Surveyors** by *T. GRAHAM GRIBBLE, M. Inst. C.E.,* Author of "Preliminary Survey," etc, etc ... 5 0

—To enable anyone with the most limited knowledge of Geodetic Astronomy; or whose knowledge has grown rusty, at once, in any part of the world, to select those celestial objects which are most suitable for observation at time and place. The only text book necessary being the Abridged Nautical Almanac or Whitaker,

SAILING DIRECTIONS.

- Canadian North Atlantic Steamship Routes between the British Isles and Canada.** Distance, Latitude, Longitude, Variation, and true Course, by *R. A. Woodward, Lieut. R.N.R.* 5 0

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J. D. Potter's various Publications	8 to 22
Books for Yachtsmen	21

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